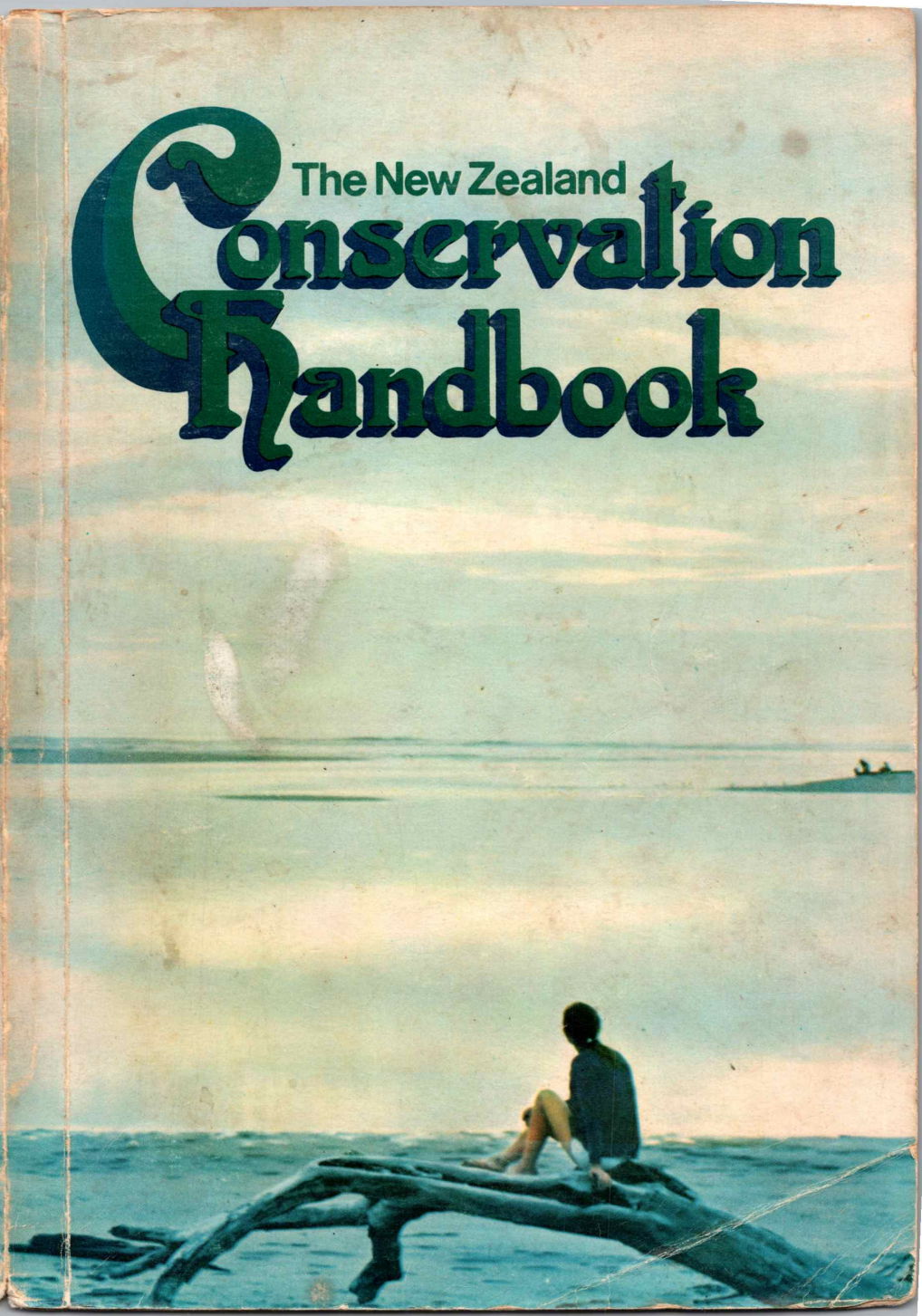
The New Zealand Conservation Handbook



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The New Zealand
Conservation Handbook

Edited by
PETER MORRISON
For
THE NATIONAL CONSERVATION WEEK CAMPAIGN COMMITTEE

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Foreword

This handbook underlines for me a basic fact of conservation. It is that in New Zealand, as elsewhere, individual initiative is as important and necessary as Government action in the fight to preserve a liveable environment.

The Government can make laws and set up the administrative framework to maintain a healthy and productive environment, but without the sensitivity of individual New Zealanders to environmental values and their willingness to act where necessary to protect them, we can achieve little.

The special value of this Conservation Handbook is that it deals not with academic theories but with practicalities. It outlines down-to-earth ways in which individual New Zealanders can get to grips with particular environmental problems and come up with constructive solutions. In essence, it answers the often-heard question: 'What can I do?'

For this reason, I would like to see the booklet, well-thumbed and well-read, on the bookshelves of every New Zealand home.

Hon J.A. Walding
Minister for the Environment

Acknowledgements

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P. Morrison
Editor.

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Introduction

Most of the content of this book is about practical activities: guidelines, in effect, to help you, as an individual, to play a part in conserving our natural resources and, in general, to show your concern for the environment in which we all live. This is by no means a new problem in the history of mankind. Air, water, soil, plants and animals are all maintained and renewed in an intricate complex that perpetuates itself indefinitely as long as all the participants keep to the rules.

Because history has shown in the past, and recent events have shown even more clearly, that man has greater power to break the rules than has the rest of the living world, more and more people are becoming aware of the need for conservation. It is not quite sufficient to define this as 'the wise use of natural resources' because there are too many differing ideas about what is 'wise'. It comes nearer to the true meaning of conservation to urge the use of renewable natural resources in such a way that they are not damaged, and are still able to renew themselves or be renewed after use.

As all the plants and most of the animals do not know any better, they go on following the rules and, when left to do so, they are maintained and renewed in a state of health and adjustment. The trouble begins with mankind, who has gradually learned a great deal about the structure of the earth and the workings of the universe and has even achieved some measure of control over the forces that keep them pulsing, but is, nevertheless, in danger of forgetting the simple facts that (a) man himself is still part of the total complex; (b) that knowledge, however vast, is never complete; and (c) that progress depends on an even better understanding of the rules.

If we can agree with this view of the human dilemma, and wish to do something about it, we are well started on the path of dynamic conservation. The idea of conserving nature and natural resources is not new. It was practised in fact by peoples living under conditions we now

call primitive. The sanctions that protected part of the hunting, fishing, or plant-food resources were often religious, but they were essentially practical. The application of 'tapu' provisions by the Polynesian peoples is an example. Unless over-population occurred, as occasionally happened on some small islands, these simple methods were effective. With the increased manipulation of natural resources seen in the growth of agricultural and pastoral economies, conservation sense was not lacking; but it was insufficient to foresee the ultimate exhaustion of the soil by over-pressure or over-grazing. The result has been that many of the former centres of flourishing human population are now the desert areas of the world.

The industrial revolution and the emergence of modern science in the nineteenth century have changed the trend, and even seemed at first to have reversed it by the application of scientific treatment to agricultural and pastoral practice. But, again, new and unforeseen threats developed and the total picture in the twentieth century presents yet another challenge, or rather a whole series of them. Human population pressure continues, accelerated by the very success of medical skills. Nor are the pressures all numerical. Technology is altering the natural environment. We walk, if at all, no longer on earth, but on concrete and bitumen. The noise level to which we are subjected continues to rise, and there is a host of other things conducive to stress. Meanwhile, as the available natural environment continues to shrink, what remains is in increasing danger from pollution, in which situation air is the first casualty, fresh water the second and, more recently, the sea.

There is, of course, a great deal of concern being shown today at all levels from governments to individuals. The United Nations Conference on the Human Environment held in Stockholm in 1972 was a recognition that the problems are indeed world-wide. In New Zealand the Government has many agencies directly responsible for the welfare of national parks and reserves, forests, and wildlife. More recently there have been set up co-ordinating bodies such as the Environmental Council, and the Commission for the Environment.

Those involved in conservation thinking, must, in spite of all this, still experience a feeling of disquiet – which is usually expressed through concerned individuals or through organised groups of the

like-minded. Some may have sectional interests, or may, like the Royal Forest and Bird Protection Soeciety, have a wide range of concern. There is some machinery for consultation: approach to Government may be direct, or may be channelled through the Nature Conservation Council set up by statute in 1962. This Council has, as well, investigatory powers and advisory functions. It has been suggested that it is not sufficiently representative and lacks executive function. Both points are worth debating. Whatever the shortcomings in various directions may be, there can be no doubt about the pitch of healthy public debate on such 'exploitation versus conservation' issues as that of the proposal to raise the level of Lake Manapouri for electric power, or of the proposal to mine Coppermine Island.

None of the issues is very simple and there are bound to be sincerely held differences of opinion. It seems to me, perhaps because I am somewhat biased as a biologist, that the life-sciences, already slightly behind the physical sciences in world impact and application, have an urgent role in interpreting the living environment. There is abundant evidence that they are doing so, but our development in New Zealand of what is called the ecological approach – a consideration of the total environment – still has a long way to go. At a more individual level I feel that every New Zealander could take advantage of living in a land where great natural diversity still exists, and seek, by personal experience and involvement, to understand what is needed to keep it so.

Sir Robert Falla
Chairman,
Nature Conservation Council.

SUGAR

Conservation in the home

Conservation begins at home. By looking in a new light at how you live and at the things you use, you will find numerous ways to help prevent waste and pollution and thereby build a better and healthier environment. Actions begun at home can quickly influence the local environment and can often lead to practical solutions to problems which interfere with the daily enjoyment of living.

Conserve household services

Water and electricity are convenient and relatively cheap – and our usage of them increases daily.

Water

Although the total amount of available water cannot be increased, more and more demands are being made on supplies. Where these are plentiful, each New Zealander already uses an average of 225 litres per day just in bathing, washing clothes and dishes, and in flushing toilets. With our present population this totals about 675 million litres a day of water that becomes 'dirty' and must be disposed of. You can reduce the amount used and the amount wasted in the following ways:

- Fix dripping taps.
- Take showers rather than baths and reduce shower time.
- If your shower is over the bath, try leaving the bath plug in to see how much less water a shower uses.

- Wait for a full load before using your dish-washer or washing machine.
- Use a nozzle with a shut-off control when washing the car.
- Bend down the arm on the toilet tank-float so it will operate with the same efficiency on less water.

Electricity

Our use of electricity increases steadily. Look around your home and count the electrical appliances you have bought over the years. How many do you *really* need?

The generation of electricity always involves environmental hazards – hydro-electric power dams use land, change rivers, increase water evaporation and, eventually, lead to the silting-up of valleys. Fossil fuels (coal and oil) produce smoke and sulphur dioxide or, at best, convert valuable oxygen into carbon dioxide. Nuclear power stations produce thermal and radio-active pollution, and there is no known way to dispose satisfactorily of nuclear wastes. The use of natural gas to generate electricity is a relatively 'clean' method, but the process of energy conversion means a high loss of potential power. Unnecessary demands on electricity cause unnecessary environmental destruction. You can help reduce electricity consumption if you:

- Avoid using heavy electrical appliances such as washers and driers during 'peak hours' – usually 5pm-7pm. Power generation needs are calculated from usage at times of maximum demand.
- Use clothes driers only when absolutely necessary. Sun and wind are free, and do a good job.

Sun and wind are free . . .

- Turn off lights in rooms you are not using and fit lower-watt bulbs in lamps not used for reading.
- Buy electrical equipment with thermostat controls.
- Turn heaters at first to 'high' to heat a room, then to 'low' to maintain a level of heat. In winter, turn your central heating thermostat down a few degrees and wear warmer clothing. Keep heater reflectors clean and polished for maximum efficiency.
- Insulate your house; vast amounts of energy are lost through walls and roofs. Insulation will also keep your home cooler in summer.
- Ensure that your hot water cylinder and pipes are well 'lagged' and that your thermostat is not set unnecessarily high (water does not need to be boiling for baths or dishes) – water heating consumes more than one fifth of all electricity generated in New Zealand.
- Keep all appliances in good order. Plan your cooking to make the most efficient use of your stove, particularly of the residual heat in your oven.
- Cover saucepans whenever you can. It costs about four times as much to keep an uncovered saucepan at boiling point.
- Use recipes that involve a minimum of cooking.

Shop with discrimination

As a consumer you can exert considerable pressure to help improve and maintain the environment. Give preference to goods and services whose production or use involves less pollution or waste – and don't be seduced by extravagant advertising into buying things you do not want.

- Buy quality goods: they last longer, can be mended, and are cheaper in the long run. Take out a subscription to *Consumer* magazine.
- Look at the packaging. Can it be re-used, refilled or recycled? Will it rot? Packaging means more use of raw materials to create more paper, plastics, and metal to be disposed of – more solid waste. Packaging is paid for by *you*.
- Leave unnecessary packaging in the shop. Explain carefully why

you don't need your toothbrush or shirt wrapped in fancy plastic and cardboard containers.

- Buy liquids in returnable containers and make sure you do return them.
- Buy products in the larger sized containers – this involves less packaging and is usually more economical. Beware of deceptive packaging. When you can, buy in bulk and share with friends.
- Avoid aerosol cans. They cannot be reused or recycled and are dangerous even when empty.
- Buy fresh fruit instead of canned juices.
- Let your aluminium foil run out and don't restock.
- Don't buy T.V. dinners in aluminium trays. Aluminium is expensive in terms of environmental costs. It takes 22 kilowatt hours of electricity to make just one kilogram of it. Aluminium foil does not degrade and the foil is unreclaimable.
- Avoid buying chemical sprays – they just cover up smells. Open windows and use fresh flowers instead.
- Modern chemical cleaners are not really better than the cheap and simple methods granny used and are expensive and over-packaged in plastic and metal. Hot water and soap with ammonia removes grease and cleans easily. If baths, basins, and stoves are wiped when still warm they don't need harder cleaning. Salt is an excellent cleaner.
- Use minimum amounts of detergent – and buy biodegradable brands in bulk-refillable containers.

Reduce rubbish

Garbage disposal is a nation-wide problem. In June 1973 New Zealand had at least 563 rubbish tips. About 74 percent of these have been used for less than 10 years and, by 1981, 59 percent will be used up and more must be created. International statistics show that household refuse amounts to an average of 2.3 kilograms per day per person and, by 1980, this is estimated to increase to 3.6 kilograms per day unless we begin now to change our 'use once and throw away' life-style.

- Save kitchen scraps for composting.

- Pass on unwanted clothes, furniture, and toys to friends or charitable institutions – call the Salvation Army.
- Save newspapers, cans, and bottles for collection and recycling. Make a list of collection agencies and organisations willing to collect waste materials, and distribute the list to other householders.
- Look in the yellow pages under –
  Second-hand dealers
  Scrap-metal merchants
  Waste-paper collection
  and contact local service groups and Scouts, Guides, etc.
- Find out from your local council if there are sites for dumping glass for recycling.

Curb your use of the car

Though a private car is convenient, its social costs are extremely heavy – in lives, hospital bills, emergency services, consumption of natural resources, and in pollution.

- Surveys have shown that the average load in the private car is between 1.2 to 1.5 passengers in a vehicle built to hold four to six people in comfort. One of the best ways to reduce congestion and pollution is to make better use of fewer cars. Consider forming a car pool for travelling to work.
- Don't use your car unless you have to. Walk, bicycle, or use public transport. When you do drive avoid quick starts and stops. Don't leave the engine running while parked.
- Match horsepower ratings to your needs. Don't buy a high horsepower car if you don't need it. Burn the fuel rated most efficient for your engine in terms of the reduction of emissions.
- Have an engine tune-up every 16,000 km or at least once a year. Be sure to change oil and air filters regularly.
- Help reduce noise pollution. Don't use your horn unless necessary for safety. Keep your muffler and tail pipe repaired.

Teaching your children

Develop and encourage in your children a delight in exploring nature, and a love and understanding of all living things – people, plants, and insects.

- Instead of their collecting specimens, try to interest children in sketching or taking photographs, or in keeping insects for a time to study (make sure that they are properly cared for and are released when the child's interest wanes). Remember, every living thing is a part of the web of life, and don't teach thoughtless destruction by your own actions.
- Join with them in going for walks both in town streets and in the country. Walking is more fun and more interesting for children than riding in a car – they can see and hear more, smell and touch things, watch how animals live and plants grow, and come to understand the pleasures of a living landscape.
- Teach them to value and to take care of all their belongings.
- Teach tidy habits. Don't allow littering.

Walking is more fun . . .

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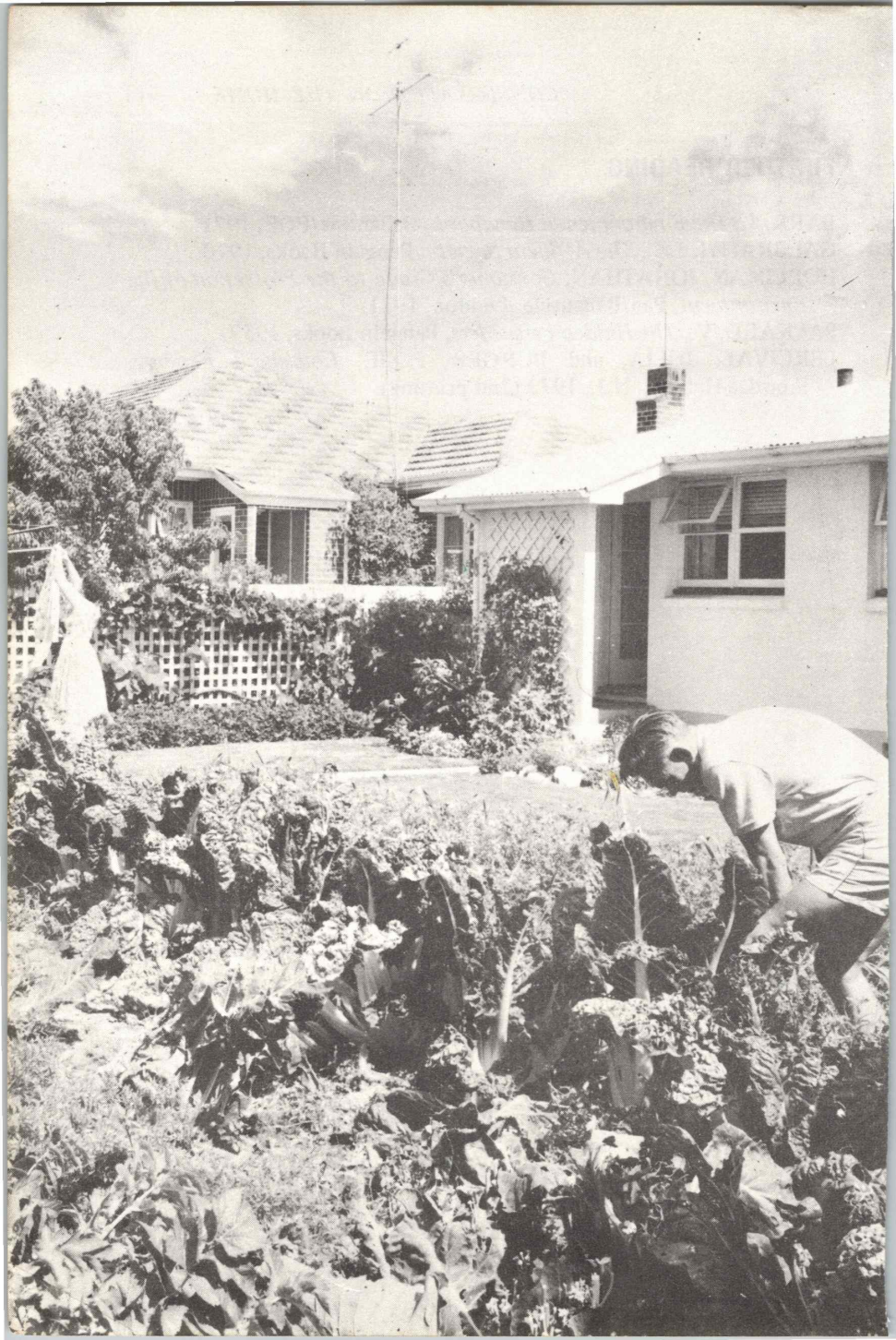


Conservation in the garden

The great majority of homes have some sort of garden which can provide an attractive setting to the house, contribute to the general appearance of the neighbourhood, supply fresh vegetables and fruit, and which can be used for outdoor living. It is one small part of the total environment which an individual can manage according to the best conservation principles and from which he can obtain many direct benefits.

Planning

Whether you're starting off with a new section or have an established garden it is necessary to have some overall plan to which you can work in establishing, or maintaining, a useful, attractive, and easily managed piece of land. There are many books which will give you good advice on the subject and professional help is available, so we won't go into the finer points of horticulture here but will point out some of the things that you should consider from a conservation point of view.

- Provision for fruit and vegetables – if you grow at least some of your requirements you can be sure of freshness and freedom from contamination. If you cannot set aside space specifically for fruit and vegetables consider the possibility of incorporating at least some in odd corners or among ornamental plants. Use fences or trellises to grow runner beans, grapes, chinese gooseberries, passion

fruit or espaliered fruit trees. Dwarf fruit trees are attractive and can be used instead of non-productive ornamentals. A citrus tree makes a good feature in a lawn. Strawberries can be grown in barrels and herbs as border plants.

- Select plants which are suitable for your soil and climate. They are more likely to grow vigorously and so to withstand disease and pests and reduce the need for special fertilisers and insecticides.
- Provide food and shelter trees to encourage birds. Even if birds do occasionally take some of your produce they will help greatly in pest control, as well as adding interest to the garden. Skinks and geckoes, which also help in controlling insects, can be encouraged by providing habitat in the form of a few loosely piled rocks or a dry stone wall.
- Consider your garden in relation to its setting. While it should have its own individuality it should fit harmoniously into the wider setting of street or subdivision. You can also consider adding to and not duplicating the variety of trees and shrubs that will increase the bird population in the district.
- Don't be in too much of a hurry to start planting. Spend some time and thought on soil improvement, temporary shelter, and particularly drainage. When you do plant trees and shrubs allow adequate space for future growth.

Maintenance

A healthy garden needs regular attention. A small amount of work at the right time will do far more good than the occasional massive 'clean up' which many people regard as gardening. Try to adopt a more personal attitude to your plants; they all have their likes and dislikes and respond to a sympathetic owner.

Soil texture

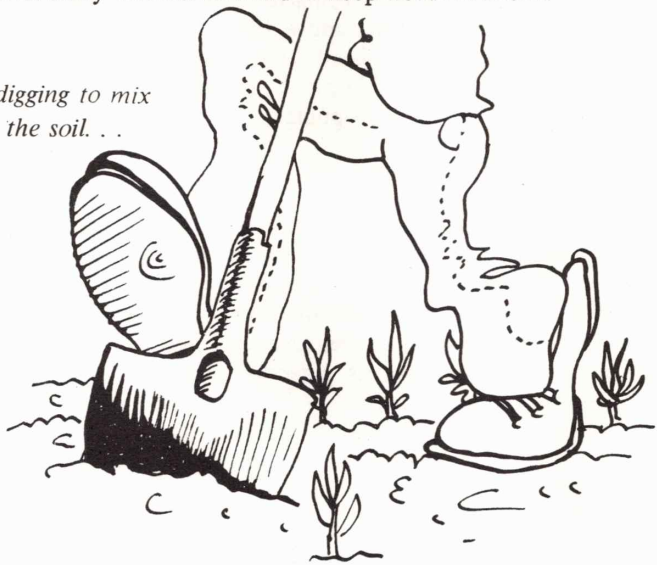
The right soil texture and structure is vital to all plants, and requirements vary. Where necessary, improvements can be made as follows:

- Add loam, clay, peat and other organic matter to sands.
- Add organic matter and coarse sand to clays.

- Add clay and sand to peats.
- Avoid cultivating clay soil when saturated.
- Regularly mix organic matter with soil.
- Remove excess water.

A great deal of work and disheartening results can be avoided if the soil is kept in good condition. Wherever the roots of established plants permit, deep digging to mix and aerate the soil should be done at least once a year. Surface cultivation with a hoe should be done frequently to maintain an easily worked tilth and to keep weeds in check.

. . . deep digging to mix and aerate the soil. . .



Mulching

Organic matter is one of the most important, and most easily exhausted, parts of the soil. It should be added frequently and in liberal quantities. A good compost heap will provide a regular supply and some other sources are sawdust (from untreated timber), straw, pine needles, seaweed, and lawn clippings. All organic matter can be first, and is best, converted into compost but large quantities applied directly as a mulch are extremely useful in suppressing weeds, improving surface textures, and conserving moisture. For example, a load of sawdust (well rotted if possible) will save hours of weeding, reduce the need for watering, and

make cultivation easier when weeds do emerge. If fresh sawdust is used, add 5 kg of dried blood to every 50 kg of sawdust to overcome a temporary nitrogen shortage.

Hygiene
A tidy garden not only looks good but is less susceptible to outbreaks of diseases and pests.

- Don't allow fallen leaves and rubbish to accumulate.
- Trim trees and shrubs regularly to avoid what eventually could be drastic surgery, and to remove diseased or dead parts.
- Remove spent flower heads and dying plants in the flower garden.
- Remove spent vegetable plants, tomatoes, peas, beans etc. as soon as they have finished cropping.

Crop rotation
Different vegetables use plant nutrients in varying ratios and crop rotation ensures a better utilisation of soil fertility. It also avoids a build-up in the soil of pests and diseases peculiar to an individual crop. A common rotation system for the vegetable garden is as follows:

1. *Leaf:* lettuce, spinach, cabbage, cauliflower, celery, silverbeet.
2. *Root:* beetroot, carrots, parsnips, turnips.
3. *Legumes:* beans, peas.
4. *Others:* potatoes, tomatoes, kumaras, onions.

Fertilisers

Healthy plants need feeding. Ideally you should have your soil analysed so that you know exactly what is required. It is not often practical to do this very thoroughly in the home garden but an occasional test can be useful so that you can correct any significant deficiency in elements. The correct amount of lime, for example, improves soil structure and tilth and helps in making other elements available to the plants. Kits are available which enable you to do your own testing.

A great deal of plant food can be provided without recourse to buying inorganic plant foods. A wide range of organic materials, often readily available at little or no cost, will do much to supply all the

nourishment required, including trace elements. Compost is indispensable in a good garden and provides a means of converting waste materials from the garden and house into a beneficial product. Seaweed, peat, straw, and animal manures are all sources of plant food, applied either direct or via the compost bin. Fish manure and blood and bone can be purchased and are good organic manures.

Pesticides

This is one subject to which the home gardener should pay particular attention. There is on the one hand the need to keep pests under control and, on the other, a need to avoid poisoning ourseleves directly or through residues in, or on, crops. Particularly important is the need to avoid building up accumulations of persistent chemicals in the soil.

It should always be borne in mind that the very small animal life of the garden, the soil micro-organisms, insects, and other invertebrates, are, in general, essential to the garden community. What should be done is not eradication but the maintenance of a healthy balance of numbers and variety – accepting a certain amount of damage in return for the beneficial aspects.

- Garden hygiene should be the first consideration – preventing the build-up of populations in accumulations of rubbish.
- When harmful concentrations do occur you can try direct methods, picking caterpillars off the cabbages, crushing aphids by running the forefinger and thumb along infested stems, leaves and buds, and picking up slugs and snails at night with the aid of a torch.
- Soapy water from the laundry makes an excellent spray to remove aphids.
- Sticky bands around fruit trees will trap insects which spend their juvenile life in the ground.
- When you feel that you have to use an insecticide, use it sparingly, and choose one with a short residual life, such as Rotenone (usually sold as derris dust); Pyrethrum (sold under various trade names); and Maldison (formerly known as Malathion).
- Do not use pesticides containing arsenic in any form or persistent hydrocarbons (DDT, Aldrin, Lindane, DDD, Dieldrin). Ingredients

are always listed on the labels of agricultural chemicals, and a pamphlet, 'Waiting Periods – Insecticides and Fungicides used in horticultural and field crops', produced by the Agricultural Chemicals Board provides some very useful information.

- Do not use insecticides when blossoms are present; bees may be killed and pollination affected.
- Cultivating the soil kills many soil pests by injury, dessication, and exposure to birds.

Fungicides

The need for fungicides can be reduced considerably by good management. Plants growing in the right conditions stay healthier than those struggling in an unsuitable environment. Grow disease-resistant plants and those that thrive in your particular climate and soil type. Relatively safe fungicides that can be used when circumstances demand are – Captan, Copper Oxychloride, Lime Sulphur, Colloidal Sulphur.

Herbicides

The average home gardener shouldn't need to use herbicides. The best treatment for weeds is good honest sweat expended in cultivation, hand pulling, and mulching.

Watering

Home gardeners can be responsible for wasting a considerable amount of water. Cutting down on the amount needed can be done by:

- Selecting the right plants for your climate.
- Work plenty of humus into the soil and apply mulches.
- Water only the plants really in need. A bucket of water applied direct to a plant will do it more good than the amount it will get during a hosing of the whole garden.
- Water during the cool of the evening.

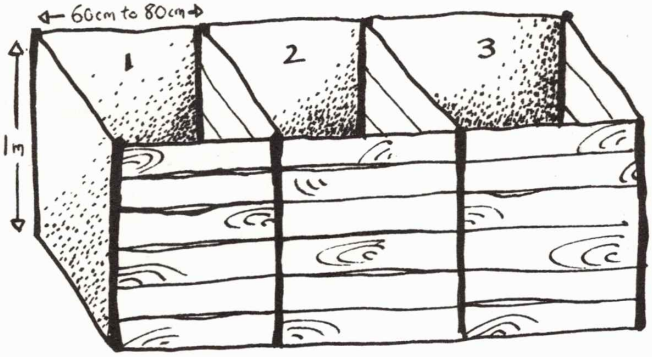
Water only the plants really in need.

- ○ Keep the soil surface loose and friable to allow water to penetrate.
- ○ Construct terraces or ridges to hold water where it is needed.

Remember that watering to the extent that there is run-off on the surface or through drains is removing nutrients and possibly the lighter organic matter and fine soil.

A compost bin

- □ Compost is best made in a bin.
- □ Build the bin on flat ground, where it will be reasonably warm in winter.
- □ One 3-bin unit is recommended.
- □ Back wall and sides can be of wood, bricks, or some form of concrete.
- □ Front panels and divisions to be of loose boards which can be easily removed.
- □ The floor of the bin should be bare ground.
- □ To facilitate aeration of centre of heap, lay downpiping or drain tiles on ground from outside to centre. A small roll of old bird netting is an alternative.
- □ Provide a cover to protect compost from heavy rains.
- □ Treat all wood for bins with preservative. Do not use freshly creosoted timber as this can pollute the compost which later may damage young plants.



Compost is best made in a bin.

Making compost

□ When building the compost heap, add sufficient organic material (hedge clippings, leaves, grass, household refuse etc.) to make a layer 15 to 20 cm thick. Cover with 2-3 cm of soil and sprinkle with lime. Continue process to top of bin.

□ If the material is rather strawy, sprinkle the layer with a handful of dried blood or sulphate of ammonia.

□ Farm and poultry manure can be added in moderate quantities as the heap is built.

□ Do not put thick woody stems or diseased plants into the compost. Burn this material and add the ashes to the compost.

□ Commence composting in bin 1; when full, turn compost into bin 2, and start heap again in bin 1. When first bin is again full, turn compost in bin 2 into bin 3 and the compost in first bin into bin 2. When bin 1 is full once more, the compost in bin 3 should be ready for use.

□ The secret of composting is to mix grass and similar soft, sappy growth in with the more strawy material, add layer of soil, and a sprinkling of lime to prevent excess acidity. Keep the compost moist but not saturated. Build the compost bin where it will be reasonably warm in winter.

□ Proprietary activators are available which accelerate composting and reduce the need to turn from bin to bin.

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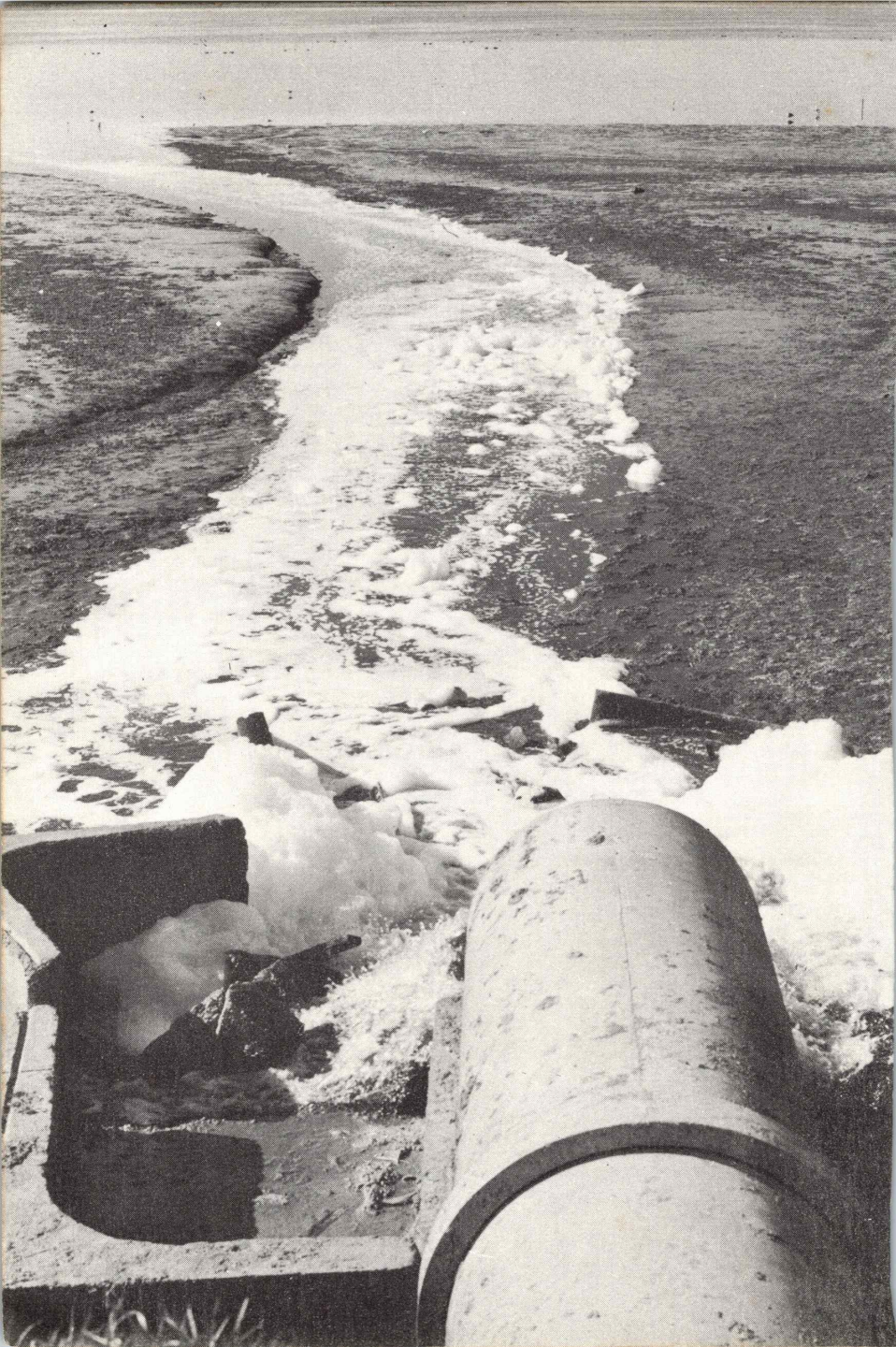


Doing something about water pollution

Water is vital to the whole structure of human life but while the population and its supporting industry are rapidly expanding, the supply of water in the country is fixed. Pollution impairs domestic, agricultural, industrial, recreational, and other essential uses of water.

Responsibilities

When the Water and Soil Conservation Amendment Act 1972 (No. 2.) came into force on 1 April 1972 the power to enforce laws against pollution of classified water was put in the hands of regional water boards. In unclassified water the boards have had this function since 1968. Except for Crown rights, all rights to discharge waste into classified water must now be issued by the boards. In a news release at the time, the Minister for the Environment said: 'Preventing water pollution is now in the hands of the people most concerned – those who use or enjoy our natural water. The machinery is there – it is up to them to use it.'

There are various ways that a private individual or any group concerned about the environment can do something about water pollution but, as in all aspects of conservation, action must be based on an understanding of the problem and on accurate information.

Types of water pollution

Polluting materials may be dissolved, floating, or suspended in the

water. Although suspended and floating materials, and discolouration, are the most obvious indicators of pollution, they may not be the most troublesome.

In New Zealand the majority of polluting materials are organic in nature. They occur in effluents from the various food-processing plants such as canneries, freezing works, butter and cheese factories, abattoirs, and from wool scouring and dye works, tanneries, fellmongeries, pulp and paper mills, sawmills, sewage outfalls, farms, gas works, rubbish tips, and truck washing yards.

There are however other polluting materials causing concern in New Zealand: dissolved nutrients such as nitrates and phosphates, metals such as mercury and arsenic (largely from geothermal sources), detergents, suspended solids (sediment from eroding land and gravel washing plants), timber preservatives, and toxic materials from gas works and other chemical plants.

Discharges which have a higher temperature than the receiving water also represent a type of pollution, as the higher temperature can change the oxygen balance and disturb the natural biological balance in the receiving water.

Pollution can occur naturally. Dark water from swamps and beech forests, and turbid water from naturally eroding catchments, are examples of this.

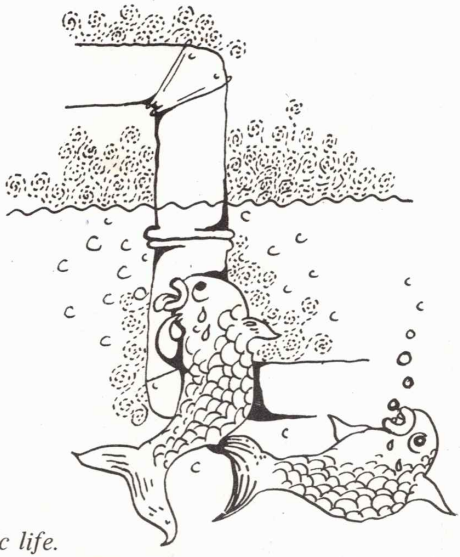
A survey

A chemical analysis of polluted water will be beyond the resources of most people but much useful information can be gathered by visual inspection and by enquiry. A survey of the water pollution in your district should cover the following aspects.

1. *Sources of pollution*

The presence of pollutants in water is usually fairly obvious and they should be tracked to as near their source as possible. This must be done with due regard to legal access however. If the pollutant cannot be accurately identified its appearance should be noted in detail. An assessment should be made of the volume of discharge. A colour photograph will be useful in supplementing your notes. The following points are worth remembering:

- At a time of low water flow, pollutants may not be washing into a main water course. Potential pollutants, such as rubbish on a streambank, should be noted.
- At a time of high water flow, pollution outlets may be covered or individual pollutants unrecognisable because of an overall turbidity of the water.
- Discolouration and debris during flood conditions indicate an unstable catchment.
- Many discharges of pollutants are intermittent and an inspection during a weekend or holiday period, when many industrial concerns are not operating, may not be as revealing as one undertaken during the week. Evidence of discharge, however, is often obvious in the immediate vicinity of an outlet.
- Clear water is not necessarily pure water. Abnormal conditions such as heavy fungal growth or lack of animal life or green plants should be noted even when there is no visible pollution.
- Excessive heat affects aquatic life. Note the presence of heated discharges.



Excessive heat affects aquatic life.

To complement the inspection of pollution sources, an investigation into local procedures for disposal of pollutants should be made. You should seek answers to the following questions:

i) Where does household sewage go and how is it treated?
ii) What provisions have been made for disposing and treating industrial wastes?
iii) How do farmers dispose of such pollutants as cowshed washings, sheepdip, sheepyard drainage, etc?
iv) What provision is made for catchment stabilisation?
v) What precautions are taken against accidental spillage from oil and chemical tanks?
vi) What provision is made for buffer zones between waterways and farm, forestry and industrial land?

2. *The effects of water pollution*

An investigation into the effects of water pollution can supply some very significant information. This can be particularly useful when the economics of disposal and treatment are discussed. Here are some lines of enquiry.

i) What recreational opportunities such as fishing, swimming, boating, and nature study are lost because of polluted water?
ii) How have property values depreciated in the vicinity of polluted waters?
iii) To what degree has wildlife been affected by pollution? Have certain species completely disappeared from some waters?
iv) What areas look unpleasant because of polluted water?

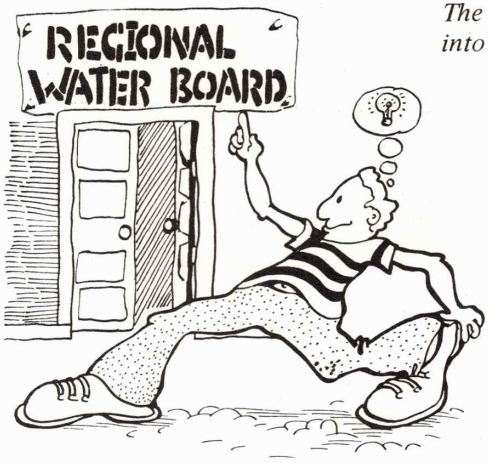
Legislation, regulations, and classification

Under Section 26 of the Water and Soil Conservation Act, when the Water Resources Council classifies water it prepares a preliminary classification, publicly notifies it and advises persons and bodies especially interested in the classification. After considering any objections it prepares a final classification which is similarly notified. Persons or bodies claiming to be affected may then appeal to the Town and Country Planning Appeal Board within two months. Reclassification of water follows the same procedure. A classification made in this way is a

declaration of the minimum water quality standards held desirable for the promotion of the conservation and best use of the water in the public interest. Existing water quality may be lower or higher than the classified standard. If it is lower then it is encumbent upon the regional water board to have the standard raised by controlling waste discharges. If the existing water quality is higher then a regional water board, if and when a discharge of waste is proposed, must not allow the quality to fall below the classified standard. It may require that the higher existing standard should be maintained but such action has to be defended on the merits of each case. Any Council, public authority or person wishing to acquire rights to natural water must apply in prescribed form to the appropriate Water Board stating reasons. Details must then be publicly notified and objections called for. Any person may within 28 days lodge an objection claiming that the grant of the application would prejudice either his or the public interest. The Board's decision must be publicly notified and reasons given for the decision. An appeal can be made by the applicant or any objector to the Town and Country Planning Appeal Board within 28 days. In the case of Crown water rights no objection stage is provided but the appeal provisions remain.

It is important for anyone taking an active interest in water pollution to be familiar with the appropriate legislation and with the local situation regarding water classification, water rights, and local body trade waste by-laws. Important sources of information are:

a) The Water and Soil Conservation Act 1967 and its amendments – available from the Government Printer.
b) If the water in your district has been classified the classification can be examined at your regional water board office.
c) The legality of discharges into water can be checked by reference to your regional water board. You can also obtain the details of all water rights issued, including waste discharges, by applying to these boards.
d) Information on the progress of water classification in areas not classified can be obtained from the Water Resources Council.
e) The local council or borough will be able to advise you on whether local trade waste by-laws have been, or are being, established.



The legality of discharges into water can be checked . . .

Using your information

- You can report unauthorised discharges to your regional water board.
- You can initiate and support efforts to install treatment plants.
- You can support efforts to get trade waste by-laws established.
- You can object to applications for water rights to discharge pollutants.
- You can make submissions regarding classifications of water.
- You can publish the results of your survey in the interests of the community.
- You can yourself discuss with the dischargers, the particular problems you and he face over effluent disposal.

Direct action in reducing pollution

So far, we have dealt with courses of action regarding the 'other' person's contribution to pollution. We can all help to reduce the problem, however, by giving some attention to our own contribution and setting an example.

In the home:

- Dispose of rubbish at authorised places only.
- Keep stormwater out of sewer intakes.
- Don't pour oils and other pollutants into stormwater drains.
- Use only biodegradable detergents and don't use excessive amounts of soaps and detergents in the laundry or kitchen.
- Save organic material for the compost heap.
- Clean out septic tanks regularly.
- Don't throw offal from deer, fish, etc into rivers or lakes. It should be buried.

. . . excessive amounts of soaps and detergents . . .

In industry – employees:

- Keep work areas tidy – waste material on the floor invariably ends up in the drains.
- Observe proper waste disposal procedures.
- Guard against leakage or accidental spillage of fuels and chemicals.
- Take an interest in your firm's waste disposal methods and co-operate with the management in making improvements.

In industry – management:

- Seek co-operation of employees in anti-pollution measures.
- Adopt a programme for a progressive reduction in the discharge of pollutants.

- Investigate the treatment and recycling of water for manufacturing processes.
- Reclaim and re-use waste materials whenever possible.
- Seek advice from your regional water board in overcoming waste disposal problems.

In industry – shareholders:

- Take an interest in your company's waste disposal problems and methods.
- Query the suitability of existing waste disposal methods.
- Be prepared to accept a possible lower return on your investment and support moves for the installation of a comprehensive treatment plant.

On the farm:

- Dispose of used agricultural chemicals and their containers in a proper manner as advised by the Departments of Agriculture and Health.
- Return cleanings from cowsheds and stock yards to the land. Don't wash this valuable source of fertiliser into the nearest drain.
- Take appropriate measures to reduce land erosion. You can obtain advice from your local catchment authority.
- Bury dead animals.
- Take rubbish to a properly organised disposal place, or if this is not practical, make proper arrangements on your own land.

In any project involving earthmoving:

- Keep the disturbance of natural ground cover to a minimum.
- Make proper provision for the control of water runoff during earthmoving.
- Make provision during planning for the repair of unavoidable ground damage.

Points of contact

Water Resources Council, P.O. Box 12-041, Wellington.
Regional Water Boards:
Auckland Regional Authority, Private Bag, Auckland.

Bay of Plenty, Box 364, Whakatane.
Hauraki Plains, Box 7, Te Aroha.
Hawkes Bay, Box 233, Napier.
Manawatu, Box 422, Palmerston North.
Marlborough, Box 204, Blenheim.
Nelson, Box 41, Nelson.
North Canterbury, Box 788, Christchurch.
Northland, Box 886, Whangarei.
Otago, Box 858, Dunedin.
Poverty Bay, Box 338, Gisborne.
Rangitikei, Box 92, Marton.
South Canterbury, Box 160, Timaru.
Southland, Box 408, Invercargill.
Taranaki, Box 98, Stratford.
Waikato Valley, Box 4010, Hamilton East.
Wairarapa, Box 41, Masterton.
Waitaki, Box 110, Kurow.
Wellington, Box 30002, Lower Hutt.
Westland, Box 66, Greymouth.

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Soil and Water, quarterly magazine, M.O.W.
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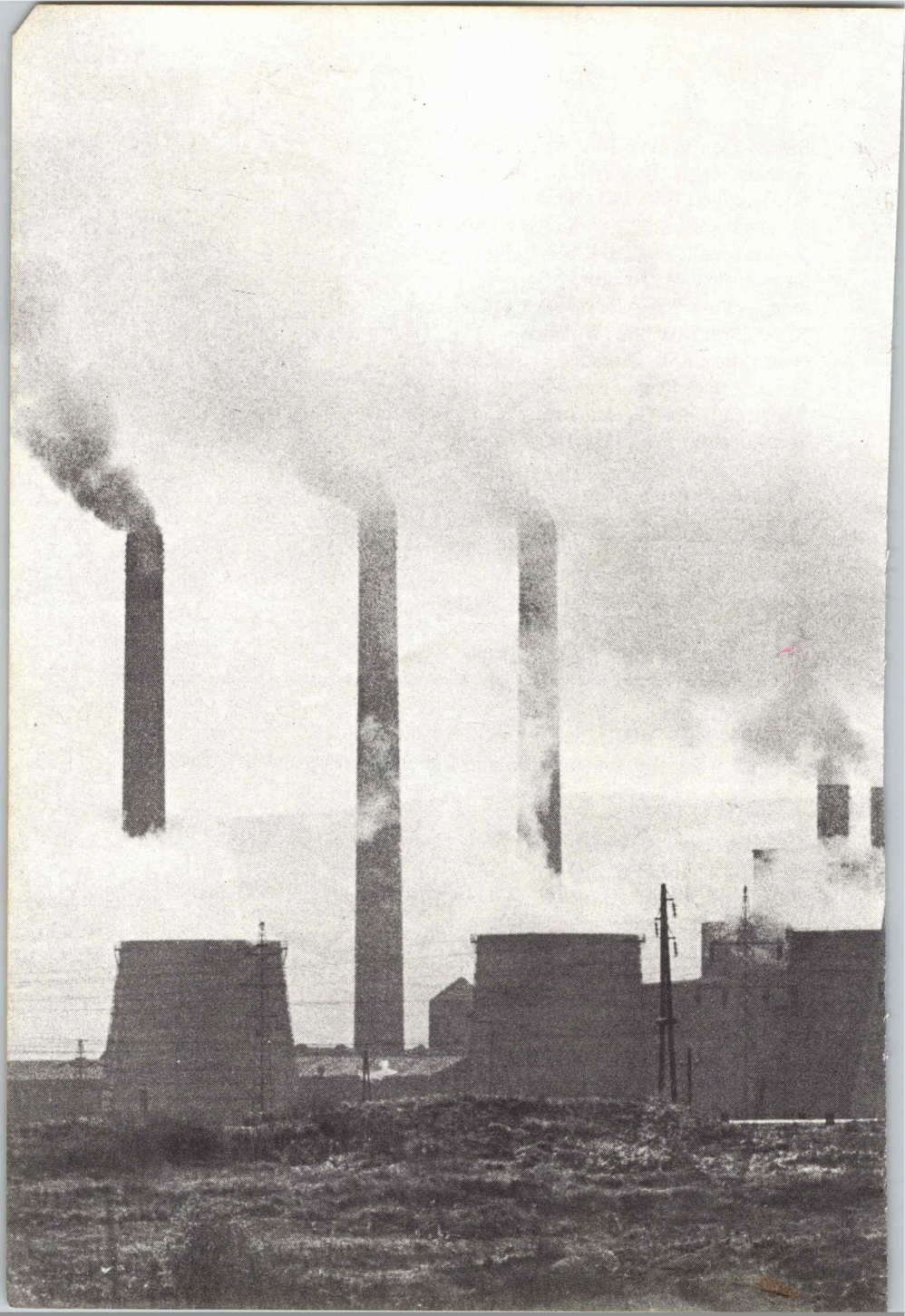


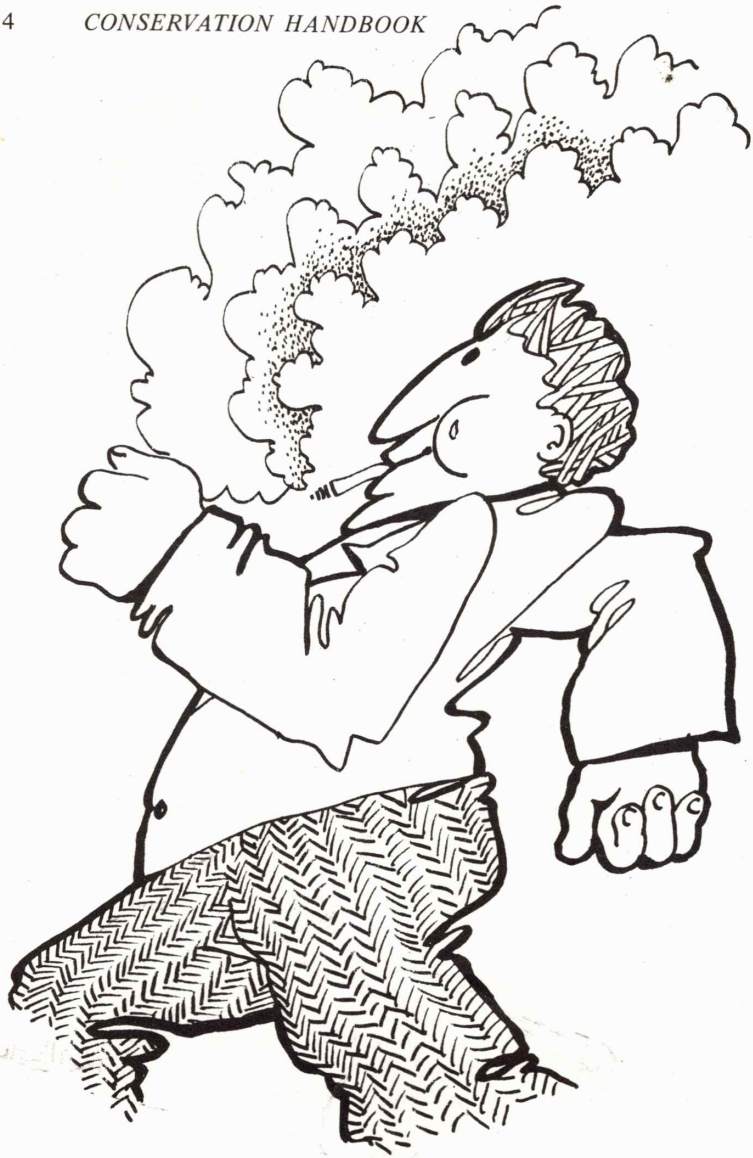
Doing something about air pollution

Air pollution is not usually regarded as one of New Zealand's major conservation problems. However, although it is not as great a problem here as in some other countries local examples of excessive pollution do exist, and accelerating urban and industrial development of the country leaves no room for complacency – if the mistakes made overseas are not to be repeated.

Air pollution can be a health hazard, contributing, among other things, to incidences of emphysema, chronic bronchitis, asthma, and lung cancer. It can damage plant and animal life, depreciate property values by corroding and soiling materials and structures, and can reduce the reliability of air and surface transport. It is insidious and, at comparatively low levels, can have a serious long terms and cumulative effect on the lives of all of us. At the very least, visible pollution and offensive odours detract from the quality of life.

Legislation

Air pollution is covered in the Clean Air Act 1972, which makes it an offence for an occupier of premises not to use the 'best practicable means' to minimise the emission of air pollutants or to render them, when discharged, harmless and inoffensive (Section 7). The emission of dense smoke is generally prohibited and light smoke cannot be emitted in a Clean Air Zone established by a local authority or the Clean Air Council. Whether smoke is dense or light can be ascertained by



The emission of dense smoke is generally prohibited . . .

comparison with a standard known as the Ringelmann chart. The sale of unauthorised fuel in a Clean Air Zone is prohibited (Section 17). Certain 'scheduled processes' have to be licenced (Sections 23 and 26).

Section 29 of the Health Act 1956 makes it an offence for certain industrial processes to emit offensive and injurious pollutants. This can include noise.

Other restrictions on noise are contained in Section 23 of the Civil Aviation Act 1964, and Regulation 190 A, Traffic Regulations 22 and 66 (1956), and the Motor Launch Regulations 4, 6, 8 and 22 (1962). See also Sections 79, 67A, 85, and 87 of the Factories Act 1946 and in the Construction Act 1954. Since 1971, local authorities with the approval of the Minister of Local Government can make by-laws to regulate, control, or prohibit the making of noise in public places (Section 386 (1) 8 A of the Municipal Corporations Act).

A survey of pollution sources

Air pollution can be either natural or man-made. Natural pollutants include: gases from volcanic and geothermal activity; smoke from forest fires; noxious odours from putrefying animal and vegetable material; plant pollens; dust storms; and sea spray.

Man-made pollutants are very often the products of combustion – mainly exhaust gases from motor vehicles and aircraft, industrial gases, and smoke from household fires and incinerators. They may also take the form of suspended solids such as dust from industrial concerns, fertilisers or insecticides from farms, or grit from road works or quarries. Heat, noise, odours, and atomic radiation are other possibilities.

Your survey should include:

i) Identification of each significant local source of pollution.
ii) The nature of the pollutant – dust, smoke, odour, etc.
iii) Weather and topographical factors which influence distributions.
iv) The frequency and times of discharge.
v) The proportion of houses with smoking chimneys. (Domestic smoke is a significant cause of air pollution.)

vi) How much pollution is due to rubbish or agricultural burning as compared with industrial sources.
vii) Information on future trends – there may be plans to eliminate certain sources and other sources may become more important.

A survey of the effects of air pollution

This can be done in a variety of ways, including:
1. *Examination of the local environment.*
Usually, visual evidence will be most obvious close to the pollution source and can be seen i) in the form of deposits of solid materials such as soot, ash, or dust on vegetation and buildings and ii) in physical changes to vegetation and surfaces of buildings. Vegetation changes can range from complete destruction, through various stages of abnormal growth, to subtle alterations in the composition of plant communities. Changes in the surfaces of buildings are most obvious on stonework but can be evident in all construction and surfacing material. By starting at a pollution source you will be able to identify symptoms as they become dispersed and less pronounced.
2. *Seeking information from local residents.*
Ways in which this can be done include distributing a questionnaire and getting your local paper to conduct a survey. Some of the questions you could ask are:

i) Do you think there is a local air pollution problem? If so – what are its effects and who is responsible for it?
ii) Does the paintwork on your house become dirty frequently? If so – under what conditions does this happen?
iii) How do you heat your home?
iv) How much fuel and power do you use in your home and in your car?
v) Do you find noise of aircraft and road traffic disturbing?
vi) Are you subjected to smoke from open burning, domestic heating, industry, or other sources? If so, state which.
vii) Have you any complaints about outdoor odours. What source do you suspect?
viii) Do you suffer from any health defects you believe to be due

to air pollution, e.g., hay fever? If so, give circumstances.

There are probably many other questions you can think of which will be particularly relevant to your own locality.

3. *Referring to available information on such things as:*
   i) The incidences of various diseases – particularly asthma.
   ii) Property values.
   iii) Traffic intensities.
   iv) The sale of fuel – coal, firewood and oil.
   v) Local industrial development.

By itself, this information may not mean much, but it could be significant when related to other information you obtain, and suggest further avenues of investigation.

Tests for air pollution

The following are simple methods of determining the amount of solid material which is deposited from the air.

Jar and funnel

You will need a large plastic or glass jar which holds approximately one gallon, and a funnel of about 15 cm diameter which fits into the neck of the jar.

The jar should be placed in an open area clear of trees and buildings, 2 metres above the ground if possible. After one month, transfer the contents into a clean pan, making sure that all the solid material is washed out. Evaporate most of the water. To evaporate the water completely, transfer the remaining contents of the pan a little at a time into an evaporating dish on a hot plate. The residue will be the solid material which has fallen into your jar during the past month. Its weight can be obtained by subtracting the weight of the clean evaporation dish from the weight of the dish and residue.

Seasonal and locality comparisons can be made by repeating the experiment month by month and by putting jars in several different places.

Open dishes or Sellotape

In dry weather, solid pollutants can be collected in shallow open dishes,

then weighed and examined. Strips of Sellotape exposed sticky side out are also useful means of collecting samples of solid materials in the air. If the strips are pressed onto a glass slide after exposure, pollutants can be identified under a low-power microscope.

More detailed methods

Information on more elaborate methods of evaluating air pollution can be obtained from the following sources:

Regional Chemical Inspectors (Air Pollution),
C/- The Health Department –

P.O. Box 5442,	P.O. Box 1475,	P.O. Box 5013,
Auckland,	Christchurch,	Wellington.

Photographic evidence

Photographs illustrating excessive smoke, burning tips, dust emissions or dust clouds from industrial or combustion works can be used to good effect, particularly if published or sent to the person responsible. They can also be used to illustrate patterns peculiar to an area, and as such could contribute to planning or siting of an industry in the most effective way. Perhaps you could make a collection of pollution photographs.

How to use your information

- You can report to your local Inspector of Public Health or the Supervising Inspector of Health of the local Health District.
- You can make your findings public and so generate interest in, and support for, anti-pollution measures.
- You can contribute your knowledge to your local conservation society or to the local branch of the Clean Air Society. They can make good use of it in their campaigns.
- You can use it to assess your own contribution to air pollution.

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CHAPIN, C., *Clean Streets, Clean Water, Clean Air,* Whitman, 1970.

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New Zealand Board of Health Report, *Air Pollution,* Government Printer, Wellington, 1970.

Recommendation for the Construction of Simple Smoke Viewers, British Standard Specification, London, 1969.

Recycling waste materials

Our present society is distinguished by its wastefulness. Not only are we using natural resources at a rate which will exhaust some of them in the foreseeable future, we are also polluting our environment with the discarded products of these resources.

Recovery and re-use of what is now regarded as waste could reduce the present rate of exploitation of natural resources and ensure a cleaner and healthier environment.

This is good in theory but it is not working out very well in practice. Why?

Because not enough people really care, and statements that it is uneconomic are accepted as valid excuses. A policy of using and throwing away may, at the moment, result in some products and services being slightly cheaper, but what will this cost us in the long run?

What, in fact, does it cost now in pollution of land, water and air?

Involvement

Implementation of adequate recycling schemes will require involvement and co-operation at every level from the individual to central government.

- Those who produce refuse must re-use what they can, sort the remainder, and assist in its collection.
- Those responsible for the disposal of refuse must introduce systems that incorporate salvage and recycling.

- Those who can re-use wastes must be encouraged and assisted to do so.
- Government must exercise its powers to ensure adequate recycling as part of its effort to conserve irreplaceable resources.

Personal action

- Press for higher deposits on all returnable containers.
- Whenever possible buy goods in returnable or re-usable containers.
- Show a preference for goods sold with a minimum of packaging.
- Persuade your union to work actively for the implementation of recycling schemes.
- Buy shares in appropriate companies and use your rights as a shareholder to influence policies on recycling.
- Press for your community to install salvage units as part of its refuse disposal system.
- Press Government to examine possible subsidies, tax concessions, or other means of encouraging industry to recycle materials.
- Speak to as many groups and individuals as possible about the need for recycling.
- Run competitions for the best ideas on the re-use of materials and articles.

In the home

What we do in our own homes and daily lives can significantly reduce the accumulation of waste material, and lead to more economical living.

Here are some suggestions:

- Use a shopping bag and avoid accumulating cartons and paper bags.
- Use both sides of stationery and notepaper.
- Save and re-use wrappings and envelopes.
- Give used greeting cards to charitable institutions.

Use a shopping bag . . .

- Give old magazines to convalescent homes, hospitals, and charitable institutions.
- Pass on unwanted clothes and toys.
- Have household appliances properly maintained.
- Save and re-use containers; remember to re-label.
- Take a container for re-filling when buying goods sold loose.
- Return all medicine bottles to your chemist.
- Make compost with all organic waste from the home and garden.
- Have separate receptacles for each class of unwanted materials or objects.
- Use your rubbish tin only when no useful method of disposal is possible.

Community activity

There are opportunities for recycling waste materials in New Zealand. More perhaps, than some people realise.

Two obstacles are the lack of adequate arrangements for collection, and of information on businesses and organisations prepared to take material.

The following local activities will help to overcome these obstacles:

- Organise regular collections.
- Assist established collecting agencies.
- Establish depots to which people may take specified categories of waste.
- Investigate all possible outlets for waste materials in your district.
- Prepare a list of collecting agencies and organisations willing to take waste materials. Distribute this list to all households.
- Organise a community clean-up day with adequate sorting and disposal arrangements.

Waste disposal outlets

Glass. Some bottles and flagons can be returned to the place of purchase and deposits refunded. Bottle dealers will often pay for all types of bottles. Some glass manufacturers will take glass in any form provided arrangements can be made for the collection of adequate quantities.

Paper. There is already a considerable amount of collecting and recycling of paper in New Zealand. Check on local collectors and firms prepared to take waste paper. Books can be disposed of through second-hand shops and book exchanges.

Scrap Metal. Scrap metal dealers will take most types of scrap metal. Check with your local dealer re collection. Milk-bottle tops are collected by various charitable organisations.

Cloth. Second-hand clothing will be accepted by various charitable organisations. Rag dealers will take certain types of cloth material.

Oil. Return used motor oils to garages for recycling or use to weather-proof garden sheds or fences.

Organic refuse. Disposable by composting.

All sorts of re-usable articles. Toys, books, clothing, domestic appliances, furniture, etc., can be sold to secondhand shops or given to charitable organisations. Be willing to give things away rather than take them to the rubbish dump.

Practicalities

Initially, any significant improvement in present recycling programmes will need considerable enthusiasm and effort from the more enlightened sections of the community. Old habits die hard and the benefits may seem remote to may people.

We appreciate that there will be difficulties that will vary from district to district, and that the advice we have given is incomplete, and, at the moment, has some practical limitations. We are confident, however, that local enterprise and initiative will produce tangible results.

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'Guidelines for Municipal Composting' *Sixth Report of the Committee on Utilisation of Organic Wastes,* Ministry of Works, Wellington, 1972.

Recommended Handouts for Sanitary Landfill Design, Construction and Evaluation, and Modern Sanitary Landfill Operation Agreement, *National Solid Waste Management Association and Federal Solid Waste Management Programme,* U.S. Government Printing Office, Washington, 1971.

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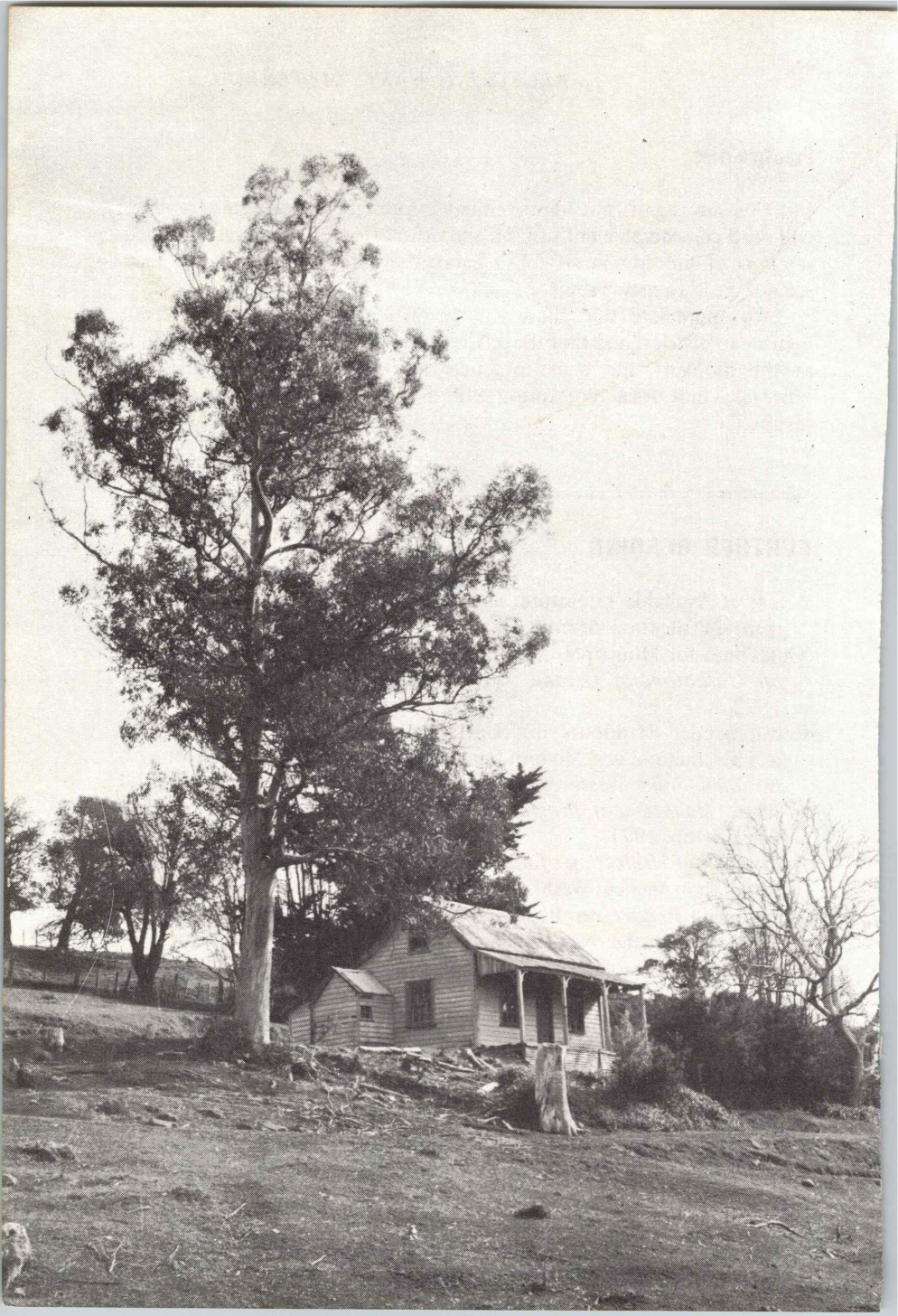


Protecting historic places and trees

Historic places

New Zealand's historic buildings and sites are subject to constant threats from processes of decay and the pressures of development. There is much that the individual can do both by supporting organisations dedicated to this work, and by personal effort, either with others or alone.

Historical organisations

In many areas there are historical and archaeological societies you can join. Members can assist societies by participating actively in their work and by raising funds for projects. In addition, associate membership of the New Zealand Historic Places Trust is open to anyone. The annual subscription is not high but the total received from this source greatly assists the Trust in its work and enables it to claim a Government subsidy of $1 for every $2 contributed. Some regional committees of the Trust also organise activities in which you can take part and those who are particularly keen to assist may stand for election to these regional committees and to the Trust itself.

Research and recording

Information is required to support claims for the preservation of historic places. Some things that can be done are:

- Prepare lists of historic buildings and sites in your locality.
- Compile a photographic record of their present condition.
- Carry out research into their history.
- Locate historic documents, photographs, and maps, and give them to a library or museum where they can be made available to others. You will usually be able to obtain copies for your own use.

Information can be given to:

i) Regional Committees of the Historic Places Trust. (The Trust has a recording scheme for sites and buildings.)
ii) Local historical and archaeological societies.
iii) Libraries and museums.
iv) Local authorities. (They can protect historic sites by including them in district planning schemes if a good case is made. Protection in this way may save a site from destruction.)
v) Department of Lands and Survey. (They can advise on and make provision for land reservation.)

Safeguarding historic places

Historic sites

- If the site is privately owned, discuss its importance and preservation with the owner. Suggest suitable protective measures and offer assistance. If the site is on a reserve, make sure that the controlling authority is aware of its importance and draw attention to anything that needs doing. There may be a need for a notice board or plaque.
- Offer to aid the controlling authority in maintaining the site.
- Voluntary groups can do a great deal in keeping sites tidy, clearing tracks, etc.

Historic buildings

- If you own an historic building, protect it and try to maintain its regional character as far as possible. Thoughtless alterations can destroy much of the value of an old building.
- If you own an historic building in poor condition, or have obtained the owner's permission to care for one, carry out first aid measures. Keep the weather out by boarding up broken windows and doors; keep animals out.

Thoughtless alterations can destroy . . .

- Before attempting any restoration work, obtain expert advice from the Historic Places Trust; an historical society; a museum or an architect with special experience in this field.

Archaeological sites

- Record the site for the New Zealand Archaeological Association's site-recording scheme.
- If you think that a site is important and should be preserved, contact the N.Z.A.A.; a local archaeological society; the regional committee of the Historic Places Trust; or your local authority.
- Don't dig on the site unless you are experienced in archaeological excavation. Join in with organised excavations by Museums, Universities, or N.Z. Historic Places Trust. Valuable evidence of the past can be destroyed by well-meaning but inexperienced amateurs. Discourage others from digging unless they are qualified to do so.

Notable trees

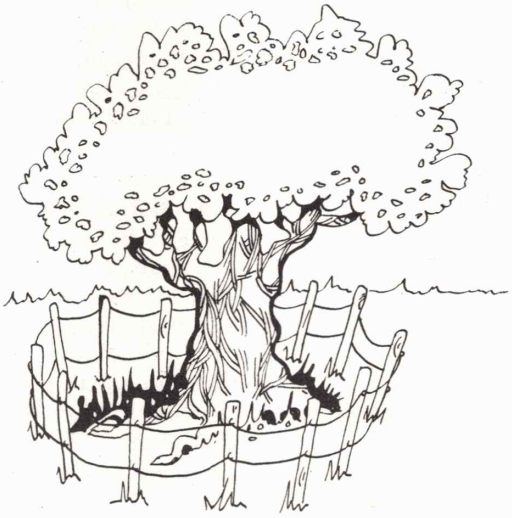
Some individual trees, because of historical associations, exceptional size, or scientific interest, merit special consideration and protection. The interest and beauty they contribute to a landscape are often taken for granted and their destruction is all too easy.

Recognition

- As with historical places the primary requirements are identification and documentation. Seek out those trees in your locality that are worthy of special protection and, where necessary, prepare a case for formal recognition of their status by an appropriate authority. There is provision in existing legislation for local authorities to take suitable action.
- Some local authorities are compiling registers of notable trees that will provide you with a starting point. In addition, the New Zealand Forest Service has made a national survey of notable trees and compiled a list that it will supply on request. You can check on the protection and condition of the trees listed and possibly supply information on other trees.
- Liaison with local historical societies, and with local botanical and horticultural societies, will help ensure that your work complements that of others. Discussion with local Maoris and a study of local history will yield valuable information.

Maintenance

- If a tree has been given some type of formal protection, it may be possible for you to take over some responsibility for its maintenance; protective fencing may be needed, possibly some form of descriptive plaque or notice board can be arranged, and there is always the need for vigilance against unsympathetic human activity.
- Even if official recognition is not achieved, or while negotiations are taking place, you may be able to arrange some form of protection and you can continue to enlist public support.



. . . protective fencing may be needed . . .

ORGANISATIONS THAT CAN HELP YOU

New Zealand Historic Places Trust, Box 12255, Wellington.
New Zealand Archaeological Association, Box 24-059, Linwood East, Christchurch, or Box 3382, Wellington.
New Zealand Federation of Historical Societies, Box 7002, Hamilton.
Royal New Zealand Institute of Horticulture, Box 450, Wellington.
New Zealand Forest Service, Private Bag, Wellington.
Department of Lands and Survey, Box 8003, Wellington.

New Zealand Historic Places Trust
Regional Committee Secretaries

Northland:	Mr A.W. Farrelly, P.O. Box 284, Whangarei.
Auckland:	Mr L.A. Sutcliffe, 70 St Andrews Road, Epsom, Auckland 3.
Waikato:	Mr G.J. Larsen, c/– Ministry of Works, Private Bag, Hamilton.

Gisborne:	Miss E. Shaw, P.O. Box 706, Gisborne.
Hawkes Bay:	Mrs C.E.W. Wacher, 31 Lighthouse Road, Napier.
Taranaki:	Mr M.J. Moorhead, 12 Kauri Street, New Plymouth.
Wanganui:	Mr E.F. Laws, 'Hillside', 185 No. 3 Line, Wanganui.
Manawatu:	Mrs M. Alcock, 486 College Street, Palmerston North.
Wairarapa:	Mrs B. Hopkins, 40 Upper Plain Road, Masterton.
Wellington:	Mr A.A. Murray-Oliver, c/– Alexander Turnbull Library, P.O. Box 8016, Wellington.
Marlborough:	Mr K.R. Wratt, 23 Berhill Crescent, Blenheim.
Nelson:	Mrs S.B. Bowman, Britannia Heights, Nelson.
Westland:	Mr A.P. Evans, Greymouth Borough Council, P.O. Box 56, Greymouth.
Canterbury:	Mr J.R. Allison, P.O. Box 1773, Christchurch.
South Canterbury:	Mr J.E. Russell, 183A Wai-iti Road, Timaru.
Otago:	Mrs G.D. Munro, 18 Patmos Avenue, Dunedin.
Southland:	Mr G.F. Blick, 86 Duke Street, Invercargill.

FURTHER READING

The following publications may be obtained from the N.Z. Archaeological Association, P.O. Box 3382, Wellington:

DANIELS, J.R.S., *N.Z. Archaeology: A Site Recording Handbook,* N.Z. Archaeological Association Monograph, ($1.00).

McKINLAY J.R., *Archaeology and Legislation,* ($2.50).

'Is there a Future for New Zealand's Past', produced by the N.Z. Archaeological Association. (Also contains names and addresses of filekeepers throughout New Zealand.)

Bulletins available from Government Printer Bookshops:

ALINGTON, MARGARET, *Frederick Thatcher and St Paul's,* (45c).

BURNETT, R.I.M., *The Paremata Barracks,* (35c).

MALING, PETER BROMLEY, *Samuel Butler at Mesopotamia,* (75c).

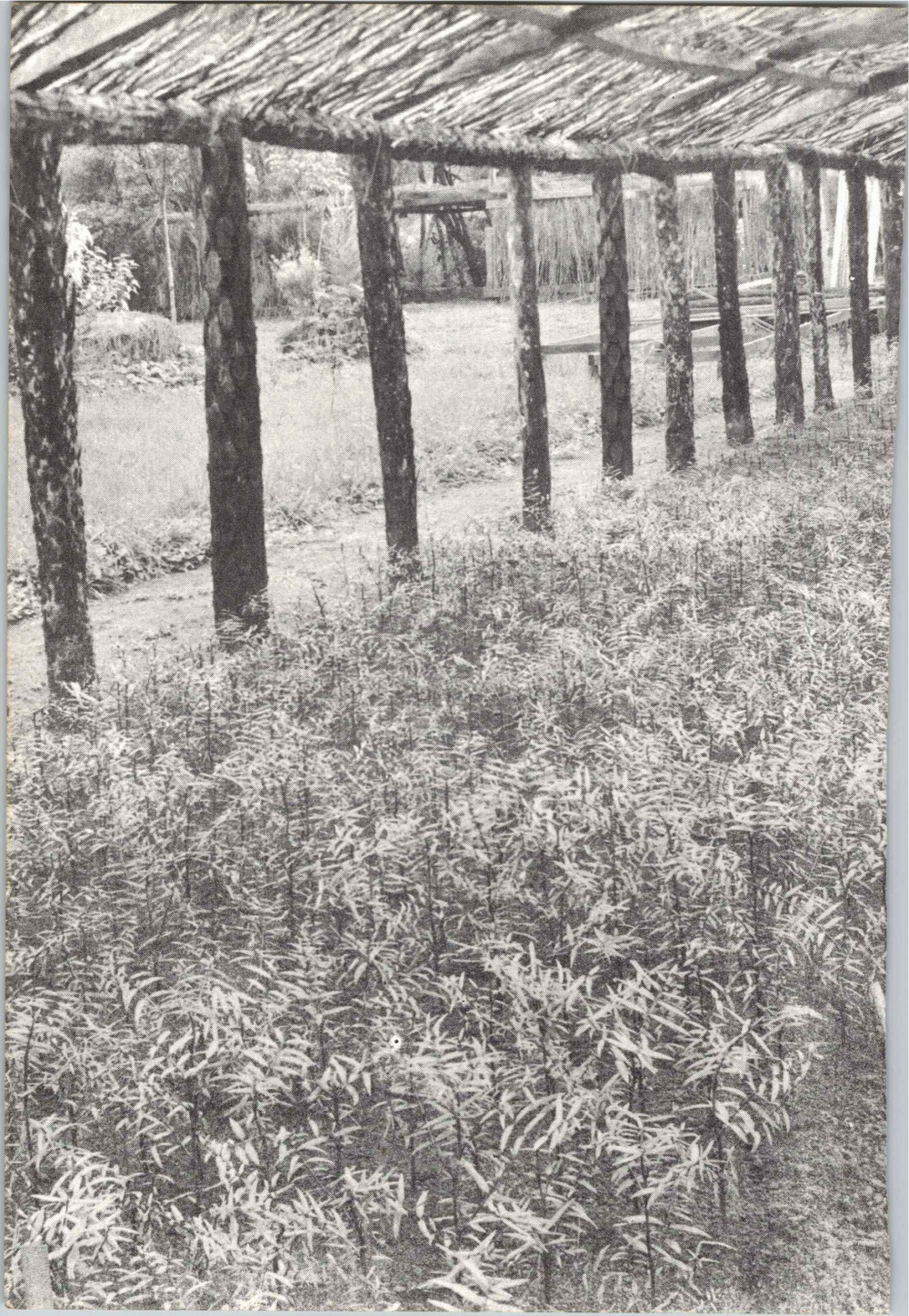
MOORE, DALLAS, *Old St Paul's: The First Hundred Years,* (50c).

ROSS, R.M., *A Guide to Pompallier House,* (45c).

STACPOOLE J.M., *A Guide to the Waimate Mission House,* (55c).

STANDISH, MICHAEL, *The Waimate Mission Station,* (70c).
WILSON, ORMOND, *War in the Tussock,* (50c).

Leaflets available from N.Z. Historic Places Trust, P.O. Box 12255, Wellington:
'The Kerikeri Mission House and Stone Store'
'A Catholic View of Pompallier House'
'The Horeke Shipyard'
'Onehunga Blockhouse'
'Te Porere'
'The Richmond Cottage'
'Paremata Barracks'
and various admission leaflets to Trust properties.



Raising native trees from seed

Planting trees, particularly our native trees, is one of the most interesting and rewarding activities for any group or individual wishing to make some practical contribution to conservation. In many instances, however, the availability of suitable young trees is a major stumbling block, especially if a planned programme is to be undertaken and quantities of particular species are required. The solution to the problem is to raise your own seedlings and the following notes on some of the more common species show how this can be done by anyone at very little expense. For other species, be guided by the similarity of the seed to those described.

Selecting seed

It is essential that seed be ripe when taken, and in many cases this can be assured by collecting it after it has fallen from the tree. In the case of very small seed, or where undergrowth is heavy, this may not be practicable and seed can be taken from the tree, judging ripeness by the extent to which seed, seed capsules, or fruit are detachable. Care should always be taken to avoid damaging trees, however, and don't take more seed than you need.

Soil mixture

Unless otherwise stated a suitable soil mixture, by volume, for germinating seeds is as follows:

2 parts good loamy soil.
2 parts peat, compost, or leaf mould.
1 part river sand.

It is important to mix the ingredients thoroughly and to keep moist and friable.

Preparation of seed

Coprosma species e.g. taupata (Coprosma repens), karamu (C.robusta), raurekau (C.australis). Also horoeka (Pseudopanax crassifolium), kahikatea (Podocarpus dacrydioides), kohekohe (Dysoxylum spectabile), mahoe (Melicytus ramiflorus), makomako (Aristotelia serrata), mapou Myrsine australis), putaputaweta (Carpodetus serratus), rimu (Dacrydium cupressinum), titoki (Alectryon excelsus), totara (Podocarpus totara).

These all have small seeds and soft, fleshy fruit which can be treated as follows:

1. Partly fill a bowl with warm water.
2. Sprinkle in fruit and gently ease off soft fleshy part with the fingers. Allow seed to fall to the bottom.
3. Pour off water and floating debris carefully.
4. Spread seed on open plate and allow to dry for one week before sowing.

Pittosporum species e.g. karo (P.crassifolium), kohuhu (P.tenuifolium), tarata (P.eugenioides).

These have hard seeds which are usually coated with a sticky substance. Don't place in water but sprinkle with sand while removing seed from capsule.

Kowhai (Sophora species).

These seeds germinate readily if they are not allowed to become too hard. Take the pods from the tree when their colour is turning from green-yellow to light brown.

Remove the seeds and test gently by squeezing; they should be medium soft, and cream in colour. Sow immediately.

If kowhai seeds are taken when fully mature and hard they will

need some preparation. Either chip the point with a knife or drop into nearly boiling water and leave to soak without further heating for at least 12 hours.

Rewarewa (Knightia excelsa).

The pods containing the seeds are easily recognisable for they are boat shaped, coloured a velvet brown, and hang in clusters from a branch. The seed, delicate and winged, should be taken when the pods start to open. Sow soon after removing from the pod without trying to remove the wing.

Houhere (Hoheria populnea), akeake (Dodonaea viscosa).

Seeds are contained in dry, winged capsules and can best be collected by shaking a seeding branch onto a flat dish. Sow immediately without removing from capsule and cover only very lightly with soil.

Pohutukawa (Metrosideros excelsa), rangiora (Brachyglottis repanda), kamahi (Weinmannia racemosa), manuka (Leptospermum species).

Great care is needed; the seeds of these trees are very fine. Collect by gently shaking seeds from capsules onto a flat dish. Sow preferably in a 50/50 mixture of sand and soil and cover with a very light coating of sand or finely sieved spagnum moss.

Collect by gently shaking seeds from capsules . . .

Kaka beak (Clianthus puniceus), New Zealand flax (Phormium species).

Collect seed when the pods open. Sow immediately and cover only very lightly with soil or spagnum moss.

Matai (Podocarpus spicatus), miro (P.ferrugineus), hinau (Elaeocarpus dentatus), porokaiwhiri (Hedycarya arborea), tawa (Beilschmiedia tawa), ngaio (Myoporum laetum), puriri (Vitex lucens).

The seeds of these trees are all contained in a quite large, hard outer shell. They can be readily collected from the ground. If the fleshy outer coat is still adhering when collected, leave exposed in trays to dry off naturally. With these seeds a random check is advised; they will often appear to be well formed but will, in fact, be empty inside the hard outer coat. Germination can take a long time and patience is necessary. It may be 12 months before seedlings appear.

Karaka (Corynocarpus laevigatus).

The large seed of this tree will germinate readily soon after it has dropped from the tree and the fleshy outer coat has dried off naturally.

Sowing

Home-made wooden boxes or the plastic dishes obtainable from garden centres can be used. Five cm to 8cm of the soil mixture are sufficient and it should be well firmed down. After scattering the seed thinly on the surface, cover with soil to twice the depth of the seed. Seeds large enough to handle individually should be spaced at about 5cm intervals. Very fine seeds are best pressed lightly into the surface rather than covered. Always be careful not to cover too deeply.

Watering

Seeds and soil must be kept moist and a good initial soaking is necessary. Regulate watering by the condition of the soil and don't be too hasty in applying water. Saturate the soil slowly with a fine spray, using an atomiser spray pump for preference. After seedlings are twelve to eighteen months old watering can be done with a garden hose fitted with adjustable nozzle or sprinkler.

'Pricking out'

This should be done when the seedlings are 5cm to 8cm high. Use the same type of boxes and the same soil mixture as for sowing. Lift and separate the seedlings and plant them 5cm apart in the fresh soil using a piece of sharpened dowel to make the hole. Press in firmly and keep the soil moist as before. There will no longer be any need to cover with glass provided there is shelter from wind and frost.

Give some protection from summer sun during the hottest part of the day.

Potting out

As the seedlings grow they will need potting out – first into small pots about 8cm in diameter and then into larger pots or polythene bags when they are about 25cm to 30cm high. Check the need for repotting by the amount of root growth.

Use the same soil mixture and loosen up matted roots and compacted soil when you re-pot. Re-potting is good for seedlings so don't start them off in unnecessarily large pots. Disturbance and fresh soil will encourage a sturdy root system that will greatly increase chances of survival at planting out when seedlings are about 50cm high.

Pests

From time to time, especially during the spring, seedlings could be damaged by insects and other pests. These must be kept in check if you are to have healthy plants and spraying with a suitable insecticide such as Pyrox may be necessary. There is no need for regular spraying provided you keep a careful watch and deal with infestations promptly.

Shelter

Some form of shelter for your seedlings is essential but this need not be elaborate. If you have a glasshouse, however, so much the better.

The simplest and least expensive shelter is a cold frame. Four boards about 15cm wide will do for the sides and an old window, obtained from demolition people, will make a good top. Drill holes in the side for ventilation.

If you can afford it, a mini glass house sold by garden centres will provide you with a neat and efficient shelter for many seedlings.

As the seedlings grow they will require less protection and should be gradually transferred to a more open situation so that they become 'hardened off' for planting out. You will find that a shelter of a simple framework covered with scrim or nylon shade cloth 52 percent used by nurserymen useful as protection from extremes of temperatures and wind in the transition from glassed protection to full exposure to the elements.

Gene pollution

Obtaining seed from trees growing in the same locality as that in which planting is envisaged has obvious values in that your plantings will be maintaining the general character of the local environment and will be of species most suitable for local conditions. Apart from this, however, it will help in minimising pollution of natural plant communities by species foreign to the area. Evidence of the evolution and migration of plants has already been blurred by indiscriminate planting in the wild of species outside their natural range.

FURTHER READING

ADAMS, NANCY M, *The Fiat Book of New Zealand Trees,* A.H. & A.W. Reed, 1967.

FISHER, MURIEL E., SATCHELL E., WATKINS, JANET M., *Gardening with New Zealand Plants, Shrubs and Trees,* Collins, 1970.

METCALF L.J., *The Cultivation of New Zealand Trees and Shrubs,* A.H. & A.W. Reed, 1972.

POOLE, A.L., & ADAMS, N.M., *Trees and Shrubs of New Zealand,* Government Printer, 1963.

SALMON J.T., *New Zealand Flowers and Plants in Colour,* A.H. & A.W. Reed, 1963.

Establishing tree and shrub communities

Trees and shrubs may be planted to improve the landscape, to prevent soil erosion, to screen an unsightly area, to provide a woodlot or some other type of productive plant association, or to provide habitat for wildlife. Whatever the object, however, it will fail unless the plants selected are suitable for the particular climate, soil, site, and intended function. The following factors should be considered:

1. *Hardiness.* The easiest way to find out whether trees and shrubs are sufficiently hardy to succeed in the climate of the proposed planting site is to note those that are already established in the general area.
2. *Soil and site requirements.* Although you may find a wide range of trees and shrubs growing in the general area you will notice that there is considerable variation in the distribution of individual species. This can be a very good guide to their soil requirements and to their tolerance of such limiting factors as frost, wind, shade, and sea spray.
3. *Form and function.* Ultimate size (both height and spread), shape, colour, and leaf form are all important details which should be noted, and taken into consideration. Much valuable information on this aspect can be obtained by carefully observing the way in which wildlife utilises existing vegetation in the locality.
4. *Growth rates.* Fast-growing species can very quickly change the character of an area, providing shade, shelter, and a rapid accumulation of humus. This is usually an advantage but careful selection and siting is necessary to ensure that the growth of one species is not detrimental to other species.

Preparation

When the site and the species to be planted have been decided on, some careful thought must be given to the timing and nature of preparatory work. You should prepare the ground several months before planting, and make provision to protect it from animals and human interference.

Some clearance of the site may be necessary, both to provide access and to reduce growth which could smother the plants you are to establish. Don't be over zealous in clearing existing vegetation, however, as this will provide shelter and soil stability.

Your next step is to decide on and mark out the locations of each new plant or group of plants in accordance with the plan you have drawn up. Once this is done the ground at each individual site should be cultivated as thoroughly as possible. Ideally, a hole up to a metre deep should be dug and refilled with a mixture of soil and organic material. Enough organic material may be available on the spot in the form of turf or decaying vegetation but if not, and the soil is obviously deficient in humus, it would be advisable to obtain and work in some decayed straw, sawdust, or other similar material.

A considerable amount of effort is involved in preparatory work but it will save a lot of wasted time and plants later on. It is far better to make a good job of small areas than to risk failure with insufficiently prepared large areas.

Treatment of plants

Whether you have raised your own plants or obtained them from a nursery you should make sure that they are in the best possible condition for planting out. The soil of pot-grown specimens should be kept moist up to the time they are planted. Bare-rooted plants obtained from a nursery should be unwrapped to prevent sweating, but the roots should not be allowed to dry out. If received too early for planting they should be heeled into fine, moist soil, or river sand. Plants with soil balled around their roots should also be kept moist.

Damaged roots and branches should be removed cleanly and, in most instances, some pruning of branches is beneficial as this reduces the demands of the root system while it is establishing itself in the new environment. It also helps to reduce wind damage.

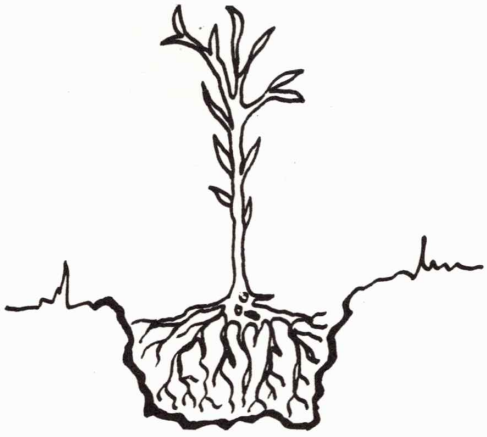
Planting time

Insufficient soil moisture at and during the months following planting is a major cause of failure. Generally speaking, trees and shrubs planted in autumn have the best chance of survival. In large-scale plantings, where artificial watering is impractical, timing is most important and will be influenced by local climate and soil conditions. Cool, showery conditions will help plants get off to a good start but, whenever possible, they should be given a thorough watering immediately after planting.

Planting

All holes must be large enough to take the full spread of the root system, and the bottom of the hole should be loosened with a fork to assist root penetration and provide drainage. Plants should be placed in

All holes must be large enough . . .



the ground at the same depth at which they had previously been growing, and any filling of the hole necessary to bring them to this level should be well firmed. Once the plant is placed in the hole, fine soil should be worked around its roots and well tamped down as the hole is filled. It is important that only fine soil comes in contact with the roots

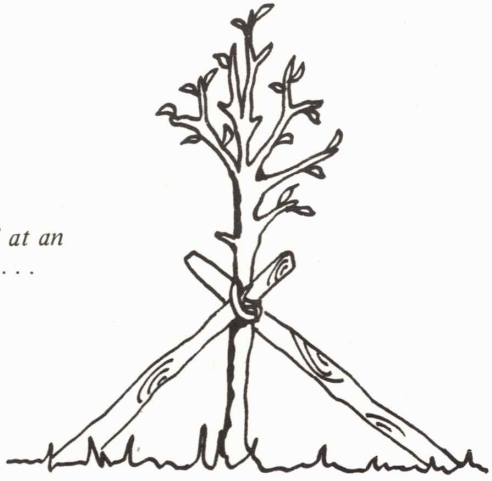
which should be arranged in their natural growth pattern. Don't just fill the hole and then stamp around on the surface – this will lead to root displacement later on as the lower levels of soil consolidate. Leave the surface of the soil around the plant flat or slightly saucer shaped, and of a loose texture, to assist moisture retention and penetration. If any decayed vegetable matter is available spread this around the plant to further aid moisture retention. Stones can also be useful for this purpose and to give some protection against wind.

Protection against wind

Unthrifty plants and many failures are due to lack of protection against wind. Adequate support to prevent wind-rock must be given to most trees and shrubs planted in exposed situations. If an upright stake is used it should go in front of the plant and on what will be the windward side. Stake and stem should be no more than 8 cm apart and, if twine is used for tying, the stem should be protected with sacking or other cushioning material to prevent chaffing.

Stakes placed at an oblique angle may be used, especially for taller specimens and those not staked at planting time.

Stakes placed at an oblique angle . . .



It may be possible to provide some form of wind shield during the early and very critical stages of root development. A screen of hessian well tied to wooden stakes is very effective, or there may be some cut vegetation resulting from clearing operations which could be arranged as windbreaks.

Willow and poplar cuttings

If cuttings or poles of willow and poplar are to be used on a large scale, considerable preparatory work is required. Poles should be cut when the leaves have fallen and the cold weather is established – July is a good month. They need not be very long or thick if the planting site is moist throughout summer; if the site is dry, use poles at least 1 metre long and 5 cm thick and insert them at least ½ metre into the ground. Poles must not be allowed to dry out and will benefit from a soaking in water before planting. Care is required to ensure that bark is not removed – if the ground is very soft, poles may be pushed in, but a crowbar should be used to open a hole where the ground is hard.

Maintenance

To achieve worthwhile results, you must give your plants a certain amount of attention, especially in their early stages of growth.

It may be possible to do some watering if this appears necessary, and cultivation and mulching around the plants will be beneficial. It will certainly be necessary to suppress any competing vegetation, to check that ties are not constricting stems and to firm-in plants that have been loosened by wind.

Protection from stock, and human beings, will have to be maintained, and the fire risk kept to a minimum by clearing combustible material on the perimeter of the plantings and especially on roadsides.

If it is possible, a handful of blood and bone sprinkled around each plant will help in the early stages of establishment. Replacement of plants that die should be made at the earliest opportunity so that the plant association develops as you have planned.

Land for conservation education

Conservation needs to be taught in practice as well as in theory. The Chairman of the Nature Conservation Council has said that we should '. . . learn from nature and how to live with it'. The use of land as a tool for conservation education is most important, particularly when a large degree of responsibility for management can be arranged. Knowledge of, and enthusiasm for, conservation can be fostered by participation in land management activities.

A continuing interest in one piece of land can be of great value. Observation and recording over a period of time will provide teachers with an accumulation of detailed information, principles of land use can be demonstrated, and natural processes can be monitored.

School land

Every school in New Zealand has some land attached to it. The use of this land to teach children the principles and practice of conservation should be encouraged. It is most important that pupils be given a sense of responsibility for the management of this land and be involved in all stages of planning.

Some schools have their own farms and it is possible that others could acquire or at least accept responsibility for areas, particularly of so-called waste land, where a continuing management programme could be undertaken.

Action

1. School Committees, Boards, and Teachers – encourage active pupil participation in management of school land.
2. Pupils – volunteer to assist with work on your school grounds and suggest ways in which you think that such assistance could be useful in conservation education.

State forests

Since 1954 the New Zealand Forest Service has promoted and administered an active programme of school participation in forest establishment and maintenance. Called the Schools Forestry Scheme, it provides for the education of children, and often parents, in the preservation of forests and in reafforestation.

The aim of the scheme is to have children plant, thin, prune and tend trees, under the guidance of the Forest Services, on areas of land set aside as School Forests.

Because the scheme provides sites for outdoor ecological studies and helps develop initiative and responsibility among pupils, it is encouraged by Education Boards in many parts of the country.

Action

Any schools interested in such a project should contact their science advisor in the Education Board District. The local Conservator of Forests may be able to help if there is no Board Scheme.

Other land administered by central or local government

The Department of Lands and Survey, the Ministry of Works, and Catchment Authorities are prepared to consider proposals from schools and conservation groups interested in taking over, for conservation education purposes, the management of suitable areas.

Action

Discuss your requirements with the District Commissioner of Crown Lands; District Commissioner of Works; or the Secretary of your local Catchment Authority.

Private land

Some private landowners have made land available to schools, conservation groups, and naturalist clubs for conservation teaching and management programmes. There is no doubt that others would welcome offers to take over the management of an area that is not essential to their needs.

Action

1. Schools and other groups – suggest to local landowners that they may have some land which could be used to mutual advantage for a conservation management and teaching project.
2. Landowners – look at your land, decide which parts could be useful for conservation projects and contact your local school, conservation group, or other interested body.

Wildlife habitats

While all land should be regarded as wildlife habitats, there are areas in which wildlife conservation is, or could be, a primary function. Establishing and managing such areas can be full of interest and provide avenues for work and study of great diversity.

Action

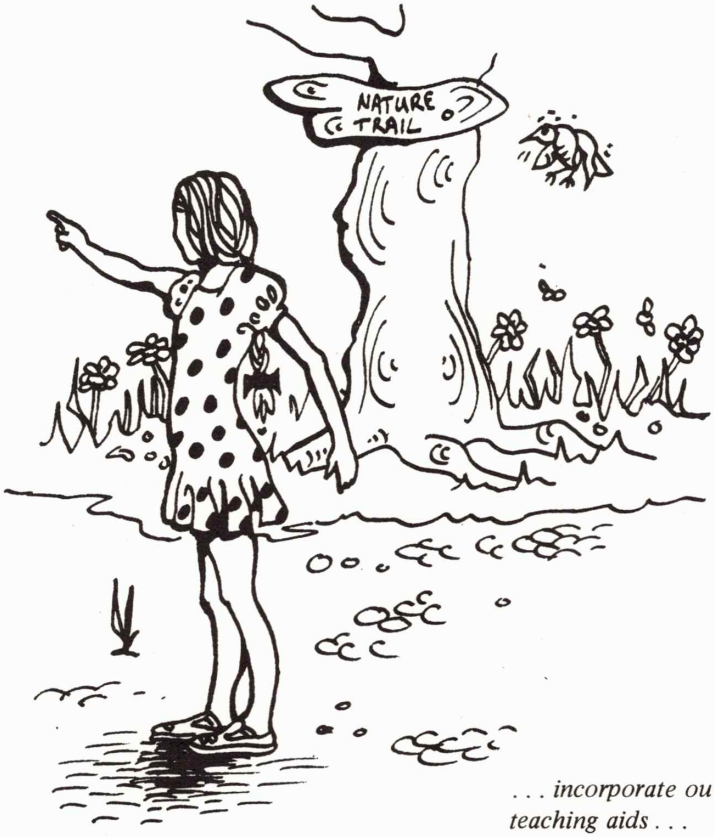
1. Survey your local area and find out where there is a need for the protection and management of special wildlife habitats.
2. Consult with the landowner and your local wildlife authority (Wildlife Service or Acclimatisation Society) regarding the responsibilities that you could assume.

Conservation centres

Conservation centres can be described as places providing facilities for live-in conservation teaching programmes. They should incorporate living accommodation, indoor teaching aids, and an area of land representing a variety of natural environments.

The land should be controlled by the organisers and be managed to demonstrate sound conservation practices and to incorporate outdoor teaching aids such as nature trails, observation hides, and descriptive material. The establishment of such a centre would be an ambitious project – but it can be done.

The Te Kauri Park Lodge, established by the Hamilton Junior Naturalists, is a notable example of what can be achieved by enthusiastic and persistent voluntary effort.



. . . incorporate outdoor teaching aids . . .

Action

1. Seek out an area of land that provides a wide range of animal or plant communities. Work towards acquiring this land.
2. Promote the venture as a community project.

School camps

A number of school camps have been established in order that children may obtain the benefit of outdoor education. These camps are of great value in conservation education, and expansion of the camp programme has considerable potential.

Action

Find out if your local school has access to a school camp. If it has, encourage its use. If you are a parent, allow your child to attend, and help the camp in any way you can. If the school does not have contact with a camp, find out why. Your interest may help to get one started.

Around the home

Anyone who takes a critical look at his residential section will see that some conservation work is needed – tree or shrub planting, clearance of weeds, stabilisation of banks, clearance of rubbish, etc.

A combined family conservation project on your section will pay great dividends – not only in improving the section, but also in giving a first-hand appreciation of conservation.

Gathering biological information

When plans are being made to decide on the future use of land, many biological values of certain areas are often ignored – and possible biological values not given due consideration – simply because they have been either overlooked, or inadequately recorded and publicised.

Some areas which, after a cursory examination, are judged to be biologically of only minor importance, can prove, following more thorough observation, to play in fact a major role as the habitat, or partial habitat, of a particular species. The importance of such places will not, however, be recognised unless someone is prepared and able to produce factual evidence of their value. Without facts, no case can be made or argument won; and without a case, 'progress', in the forms of housing development, river diversions, lagoon draining or road building, will continue to change the environment to the detriment of the plant and animal life inevitably dispossessed.

We may feel indignant and complain to ourselves on reading in a newspaper that a road is to be constructed which could well ruin some pleasant location where we so enjoyed camping last summer. We may even try to remember if that was the place where we saw the dabchicks nesting, or remarked on the beauty of a colony of native orchids? We may wonder, too, whether anyone else has noticed these things. If we could remember accurately what we did see and where, we would be able to write to the authority concerned describing in detail just what natural features could be destroyed by its proposed action; and we could let others know by writing to the papers. That such action can

bring results is illustrated by the fact that a road realignment scheme in Otago was modified to save a penguin colony – simply because someone was aware of the colony's existence and made sure other people became aware of it. Usually, however, we finish our reading without taking any positive action – and the orchids are bulldozed away and the dabchicks have that much less living space. We should, therefore, think seriously about recording some of our observations – at least those which we consider to be of interest or of importance; memories quickly become hazy and nobody is going to take much notice of or be impressed by vague recollections. It is encouraging to remember that some of the most important natural history work carried out in the world is that done by amateurs. Our contributions can, then, have scientific value; and they will most certainly have personal value as they will give us a greater understanding and appreciation of our environment.

What to record

How many plant species are there in that bush gully at the back of your house? What bird species breed in your neighbourhood? Have they changed much or at all over, say, the past five or ten years? What is the insect population of a local stream? Has it decreased since the new housing sub-division was established near its banks?

If you try to obtain this type of detailed information from your local library or from other sources, you will probably be astonished to find just how little is available. There is really, therefore, so much to record that any observations time and opportunity permit you to make are valuable. If you can co-ordinate your recordings with similar activities being undertaken by other people, so much the better; but don't worry too much about duplicating others' efforts. Several independent observations are useful for comparison purposes and to corroborate each other; and, often, conditions in a stream or on a hillside can change so rapidly that regular updating is necessary.

How to record

Because events or items committed to memory have so often become

hazy or distorted by the time they are put to paper, it is important to ensure that, whenever possible, all observations are written down at the time they are made. A pocket-sized field notebook is therefore essential.

- Your observations need not be typed, technical, or written up in essay form. They need only be brief, accurate, and available when they are needed. It is a good idea to transfer your field notes to indexed cards or to loose-leaf notebooks, as this will make information more readily accessible and will ensure that you still have your records should you have the misfortune to lose your field book.
- Always note the date and location. A simple plan of the area is useful, even when it is possible to provide map references.
- If – and when – you come across something you are unable to identify, make sketches and take descriptive notes on the spot. It is unwise to rely solely on your memory when later consulting reference books or experts.
- Whenever you can, take photographs to supplement your other notes. These are very useful and effective as evidence, and for recording changes.

Selecting a project

Before deciding on any form of natural history recording, you should make sure that whatever you choose is within your capabilities. The two major considerations to be taken into account when making up your mind are:

i) The time at your disposal.
ii) Your degree of familiarity with the subject.

Although a few types of recording can be done during the course of your normal day-to-day activities, most require that some time be especially set aside at regular intervals. The ability to identify accurately various plants and animals is essential. Although it is certainly possible to obtain expert help and to make use of references, it is nonetheless impractical to rely too heavily on these sources. It is

far better and more sensible to start in a small way and allow your project to expand as your knowledge increases, than to begin something too ambitious which you cannot bring to fruition.

Your primary goal should be to record the presence, distribution, and abundance of the wild plant and animal life of a district. Two main ways in which this may be achieved are, firstly, to attempt a complete list of all the flora and fauna in a small area, or, secondly, to choose a single species and plot its distribution over the whole district. (This latter course could be valuable in a campaign aimed at the conservation of a relatively uncommon species.)

You may well find that a particular plant or animal occurs in only one or two places – in which case these areas will be worth special attention, and you will have good grounds for arguing that they receive it.

Lists

Making a list of the plants and animals which occur in a given area is the simplest form of recording and one which is available to almost everybody. Indeed, it may be the only practicable method for some.

Add to your list gradually, as new species are seen and as time and opportunity permit. Why not start with the birds in your own garden, or those you see on your way to work or school? If there is a small patch of bush handy to your home, you can make a beginning by listing the plants that occur there. Start with the ones you already know, then try to identify and add to your tally just one or two more on each visit.

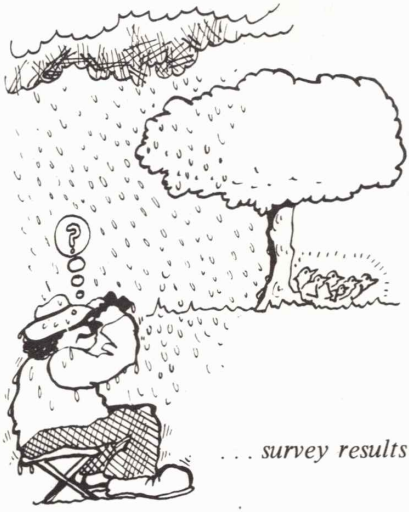
This type of recording, which can be included into your daily routine or done during moments of spare time, will eventually reward you with a good general knowledge of what flora and fauna occur in an area, as well as providing you with basic information which could be most useful for starting a further and perhaps more detailed study.

Surveys

Although a simple list will tell us what kind of animals or plants are present in a specified area, it will not tell us anything about total

numbers, population trends, or whether certain animals are resident all the year round. To find out these things, which are important in assessing the total values of various habitats and which serve as a guide to future management, we will need to make some sort of survey.

Surveys can be broadly divided into two main groups: those which completely cover an area, and those which are based on a sampling technique. If the aim of a survey is to show evidence of population changes, it will need to be repeated at regular intervals using, as far as possible, the same methods and conditions each time. This is important, as survey results can be influenced by such varying and often seemingly inconsequential factors as the time of day, the day of the week, the weather, the numbers of people involved, and even whether they are the same people on each survey. (The results obtained by two people searching an area for half an hour could be quite different from the results obtained by ten people searching the same area for four hours.)



. . . survey results can be influenced . . .

The following are a few simple surveys which can be done and repeated at, say, monthly intervals:

1. Make a count of the numbers of each species of sea bird seen on a walk along a measured length of coast.

2. Position yourself in a suitable spot overlooking a pond, stretch of river or bush track, and record all the wildlife you see in any of these habitats in approximately two hours.
3. Choose a prominent rock (but one which is not too large) in the tidal zone and make a count of the shellfish clinging to it at low tide.
4. Select a small, coastal rock pool or freshwater pond and list its plant and animal life.
5. Sit quietly on the bank of a stream and record animal movements in, or under, the water.
6. Visit a bird nesting colony (shags, gulls, etc.) once or twice a year on the same dates and record the number of occupied nests (be careful not to alarm the birds in any way).
7. Do a simple survey of the insects in a stream by first deciding, along a small stretch, the boundaries within which you will work. Then, within your chosen area, lift a stone carefully and count the different types of larvae and eggs attached to it. Replace the stone in its original position and repeat with stones in varying depths of water.

More ambitious surveys, using precise sampling techniques such as line transects, sample stations and quadrats, can also be done, but it is beyond the scope of this publication to provide other than the most basic explanation of these methods. If they are attempted, expert advice should be sought both in their planning and in the interpretation of results.

Line transect

Any area of study conducted along a straight line from point A to point B. Transect lines are often first drawn in on a map before being marked out in the field. The length and width of any transect are completely variable, as they are governed by the particular needs of the study concerned, the number of people involved, their capabilities, and the time at their disposal. Observations may be made continuously along the entire length of the transect, or intermittently, at predetermined checking points.

Sample station

Any point in a study where observations are made. Sample stations are often used along transect lines but are included as well in many other methods of study. The area of a sample station is regulated by the same factors as that of a line transect.

Quadrat

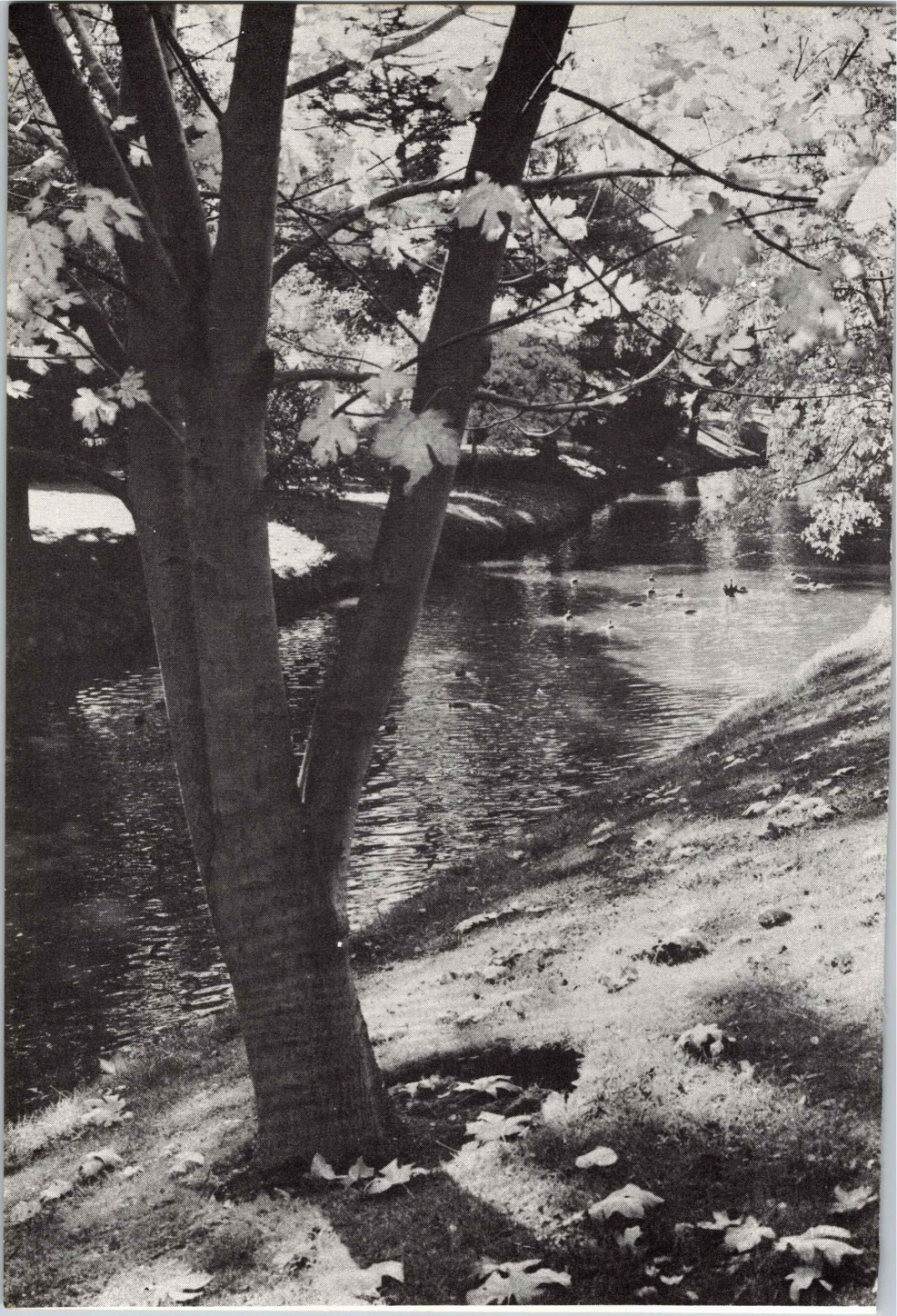
A quadrat is an area usually – but not necessarily – marked out in the shape of a square within which detailed studies of flora and/or fauna may be made. It is a sample plot contained within, and representative of, a total area too large to be otherwise covered in its entirety. Quadrats may be either temporary – designed to achieve immediate results and to help solve current problems – or permanent – where the objectives are long-term and require that identical areas be re-studied after a period of years.

Applying your information

- Present any relevant facts you may have when local environmental issues arise.
- Contribute articles to the local newspaper.
- Write articles for the magazines of organisations interested in the environment.
- Contribute papers or short notes to scientific journals.
- Talk to other people about your work and discoveries.

FURTHER READING

DOWDESWELL, W.H., *Practical Animal Ecology*, Methuen 1963.



Providing wildlife habitat

Wild creatures, even though we may not be particularly aware of them, play an essential part in maintaining a balanced and healthy environment and contribute a great deal to the appearance and atmosphere of our surroundings.

Much of New Zealand's original wildlife habitat has been either destroyed or seriously modified, but we can make some compensation for this in the way we manage man-made environments.

Wildlife land

It is wrong to think of land for wildlife solely in terms of those special areas specifically set aside as reserves, sanctuaries, etc. Practically all land, even when in the heart of a city, is able, if managed correctly, to support a considerable variety of wildlife. It is, in fact, in urban and farm environments that management can yield the greatest results and be best appreciated.

Wildlife requirements

Though no two kinds of wildlife have identical living requirements, all need cover, food, and water. Most forms of wildlife require several types of cover which, apart from providing protection from the elements and from enemies, also conceals their nests and young. Food, to be really useful, must be plentiful, close to cover and available

throughout the year. Water may be required in minimal amounts or it may be a major feature of the habitat, as it is for sea and water birds. To manage successfully land for wildlife we must find ways of improving the amount, quality, and distribution of cover, food, and water according to the needs of the species to be encouraged.

As plants are a major feature of most wildlife habitats it is in their selection and cultivation that we can most effectively make improvements.

- When planting trees and shrubs give first preference to those known to be favoured by nectar, fruit, and foliage feeders as providers of food. These same plants will also attract and harbour prey for insect eaters.
- Food-bearing plants should be selected to give a year round supply of food. Books are available which list flowering and fruiting times.
- To provide adequate cover, plants should be grouped in mixed communities. Position thick, low-growing shrubs around the edges, and ensure that there is considerable variety in height.
- A thick ground cover of humus should be established both for the health of the plants and to encourage a food supply for insect-eating birds and small reptiles.
- Where open water is present or can be created, sections of the banks of streams and ponds should be well vegetated to provide escape cover and food for water brids.

Towns and cities

Most urban areas have open spaces in the form of parks, playing fields, school and hospital grounds, river banks, motorway verges, etc. At the present time, most of these are managed only for their primary function and for their appearance; yet, if wildlife interests were considered, these would not interfere with that function but, in may cases, would enhance it. Even where large expanses of grass are a necessary feature of parks and domains, well-planned groupings of trees and shrubs rather than isolated specimens would improve conditions for both humans and wildlife. This is primarily the responsibility of local authorities, but suggestions and offers of assistance can be made which

may well stimulate interest and action. One sphere in which voluntary groups can be most active is in the tidying and planting of many odd corners of wasteland for wildlife habitat. Although it may not be possible to introduce much variety into one small area, variety can be achieved in the general locality by careful planning and the planting of individual sites so that they complement each other:

Private gardens

Although the average garden is too small to be a complete habitat for all but the smallest forms of wildlife, it can be planned so that it provides requirements which contribute to the usefulness of the general neighbourhood to many species. Birds will quickly respond to the provision of habitat requirements and will often seem to arrive from nowhere when the right conditions are established. The attraction of small gardens can often be increased by making some plantings of trees and shrubs coincide with those of your neighbours. If two small thickly planted areas can be arranged adjacent to each other on either side of the boundary, their effect will be enhanced. If you are fortunate enough to possess a large garden you can set aside a 'wild' area where plants can grow unchecked and disturbance kept to a minimum; such an area will provide good nest sites. Even in a small garden a thickly planted corner will provide shelter and possible nesting sites.

Certain birds, if they inhabit the general area, can almost be guaranteed to visit a garden if particular trees are planted. Kowhai, winter-flowering gums, and bottle-brushes for tuis and bellbirds, and tree lucerne and laburnum for native pigeons are a few examples. A simple way to find out what are major attractions at different times of the year is to do a little bird watching around the neighbourhood or perhaps organise a survey of local gardens as bird habitat. Such a survey could well stimulate interest and perhaps some co-ordinated effort.

In climates that are generally colder than New Zealand's, many home owners obtain a lot of pleasure from feeding birds – especially during the winter. In very harsh conditions this practice probably has a significant effect on the local survival rate of certain species. In New Zealand, where there is usually more natural food available during the colder months for the smaller birds that frequent our gardens, feeding is

probably not so important to survival; nevertheless, some supplementary feeding will be an attraction and could induce birds to remain in the garden.

If tuis and bellbirds are resident locally they can be accustomed to taking honey water (one tablespoon of honey to ½ litre of water). If this is put out, however, it must be replenished regularly both to maintain its freshness and to condition the birds to expect it.

Other birds will take a variety of food, and by offering as varied a selection of kitchen scraps as possible one can soon see the preferences of different species. Seed, as supplied to cage birds, will attract finches. White-eyes will sip honey water and are particularly fond of apples, pieces of uncooked suet, and hunks of mutton-flap fat which can be hung from tree branches in a small wire basket, impaled on a nail in a post or tree trunk, or suspended by string from any convenient projection.

If a bird table is built it should be placed clear of any cover which would allow a cat or other predator to approach unobserved. Your bird table should be moved occasionally to prevent the danger of rotting food accumulating on the ground, thereby harbouring disease and encouraging rats and mice. Remember that overfeeding and feeding foods such as bread which attract only or mainly sparrows may result in these birds appearing in numbers which become a nuisance to you and to your neighbours.

In dry weather, birds appreciate a supply of water for drinking and bathing. A shallow bird bath with a stone placed in it for perching can be an interesting centre of activity. As with a bird table, cleanliness and regular replenishment are important.

Farms

Farmers, because they are responsible for the management of so much land in New Zealand, have a substantial influence on wildlife populations. Farms may be almost devoid of wildlife or may support thriving numbers which are a useful and an attractive by-product of fertile and healthy land. There is no doubt that if more consideration was given to farms as balanced environments, the overall situation

regarding many bird species could be improved enormously without in any way prejudicing farm production. The subject cannot be treated exhaustively here, and, indeed, we have still much to learn about this type of wildlife management in New Zealand but the following suggestions outline possible courses of action for farmers and those individuals or groups whose assistance might be welcomed by farmers:

- Bush remnants still persist on many farms. These should be fenced to permit regeneration and the re-establishment of a more productive habitat.
- Odd corners, gully heads, or steep slopes could be fenced, and planted with a variety of trees and shrubs which would also help to reduce erosion.
- Hedges and shelter-belts can provide important habitat requirements as well as giving shelter for stock. Plant a mixture of bushy shrubs rather than a formal, one-species hedge. This will supply a wider range of food over a longer period and will extend the choice of shelter and nest sites. Depending on soil and climate, the following species are some of many that could be considered – multiflora rose, lonicera nitida, berberis, cotoneaster, laburnum, flowering gums, taupata, corokia, karamu and five-finger.
- Streams and natural ponds, apart from their obvious value to stock, possess great potential as wildlife habitat. But very often this potential is not developed because stock are allowed unlimited access, thereby destroying surrounding vegetation which would otherwise be of use as food and shelter. Access by stock should therefore be restricted to parts of banks and margins.
- Most farmers can attract waterbirds by making ponds. A swampy gully with a gentle gradient is an ideal site, and dams can serve a secondary purpose by acting as crossings for stock and farm implements. Expert advice should be sought, however, before any dam construction is attempted. A single island in a small pond (or several islands in a larger pond) is a great encouragement to ducks. For best results, all islands should be planted.
- Some densely overgrown swamps should be retained. They are often inhabitated by unobtrusive waterbirds such as the banded

. . . by making ponds.

rail, bittern, marsh crake and spotless crake. A fence will eliminate danger to stock.

- The greater the variety of habitat, the more species benefit, and if some sections of large areas of overgrown swamp (where raupo is often the dominant vegetation) are opened up to provide clear water, this will help to increase the duck population. With all water and swamp areas a balance should be struck between open water, emergent water vegetation, overhead cover in the form of trees, and open margins.
- Starlings, because of the large quantities of insects they consume and their habit of probing the ground for grass-grubs, are useful birds to encourage around farms. They will readily use a nest box attached to an out-building, a tree, or even nailed to a sturdy stick which is in turn fastened to a fence post. Where mynas are also present, they can oust starlings from nest boxes, and for this reason entrance holes should be no greater than 48 mm (1-7/8 in.) in diameter.

FURTHER INFORMATION

'Tree Planting for Native Birds' – Wildlife Service

Treatment of ailing wild birds

Legislation

All of New Zealand's native birds with three exceptions, the black-backed gull, black shag, and harrier hawk, are protected under the Wildlife Act, together with gamebirds outside the shooting season. They may not be hunted or killed or *held in captivity for any period;* nor may their dead bodies be kept.

However, provision does exist for them to be cared for in captivity when sick or injured. If you decide to attempt treatment of a protected species you should write to the Secretary for Internal Affairs for a permit to hold the bird temporarily until it is well enough either for release into the wild, or to be permanently looked after by an approved zoo or other institution. If it dies, its body should be frozen and sent to the nearest of the country's four major museums as soon as possible. These stipulations are set out on the holding permit.

Identification

Because of the above and, as feeding requirements vary with different species, it is important to make a correct identification as early as you can.

Abandoned young birds

If the bird is reasonably well grown and feathered, it is probably still being fed by its parents and should be left where it is. If it has been

moved, it should be returned to natural cover near to where it was found. Assistance should be given only if it is obvious, after observation, that the bird has been abandoned.

Shock

Many birds apparently in need of treatment have sustained only a minor injury but are in shock or stunned. Given a little time, they will almost certainly recover of their own accord and need only to be put in a quiet, sheltered place out of the reach of predators.

A bird in shock should *not* be fed alcohol in an attempt to revive it. Treat by keeping it quiet, handling it as little as possible and maintaining its body temperature. A valuable pick-me-up to restore energy quickly is a warm, strong solution of glucose and water or sugar and water administered by eye dropper or syringe.

General exhaustion

Sometimes, especially after bad weather, a bird may be found which, though physically uninjured, is thin, loose-feathered and inactive. Such a bird is probably suffering only from exhaustion. Prepare a box with a soft floor lining (change when soiled) and place in a quiet, warm spot. Feed at least three times a day and force-feed if necessary.

Treatment of injuries

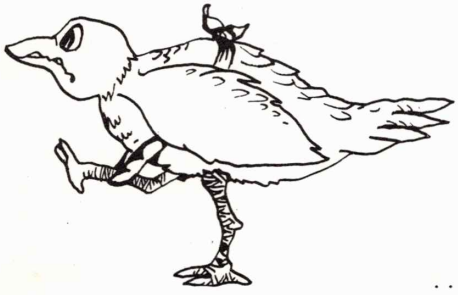
First try to gauge the extent of the injuries. If there is a great deal of external damage – e.g., more than one broken limb, severe lacerations to the body, extensive loss of feathers and/or blood – the bird should be destroyed. If there are no external injuries but bleeding from the beak is noticed, then the bird almost certainly has internal injuries and should be destroyed.

Raw and sore areas
Treat with a gentle application of a weak solution of Dettol (two drops per teaspoon of cold water), or dust with an antiseptic powder. Do not use ointments.

Minor cuts with some feather loss
Injuries of this nature are often caused by gunshot wounds or an attack by a cat. In addition to treating for shock, any visible shot should be carefully extracted, and the wound washed with clean, warm water, gently dried, then dusted with an antiseptic powder. Do not use an ointment as this collects dirt.

Broken leg
Because the two upper parts of a bird's leg are concealed by the skin of its side, it is not possible to splint any break occurring above the so-called knee joint (in reality, the bird's 'heel'), and humane destruction is the best course of action. However, fractures below this joint can be set if they are not multiple or compound (i.e., bones protruding), in which case the bird is best destroyed. As a certain amount of necessary swelling takes place during healing, nothing should be bound tightly against the leg as this is likely to interfere with circulation. Instead, a split length of feather quill (or tube made of foil, or heavy paper or cardboard) approximately the diameter of the leg and cut to an appropriate length can be sprung around the fracture and secured by adhesive tape. This will safely splint the leg for the three to four weeks it needs to mend.

An additional safeguard to discourage unnecessary movement and to prevent the fracture from twisting is to support the injured leg in a natural position near the underside of the body by a foot sling made from two narrow strips of adhesive tape and wound around the bird's body but beneath its wings – leaving them free to assist with balance.



. . . support the injured leg . . .

Broken wing
A broken wing will not usually need a splint. It should be arranged in a natural position close to the body and bandaged with adhesive tape. Leave the good wing free. Place the bird in a restricted enclosure with one very low perch (if a perching species), and put food and water where they can be reached with the least possible movement.

If a bird persists in breaking free from the bandage, an alternative treatment is to clip short the flight features and secondary feathers of the wing and keep the bird as quiet as possible, trusting to time to heal the break successfully.

Plumage clogged with oil

A bird which is thin, or has a sharply protruding breastbone, or passes a large amount of oil in its droppings, has a very poor chance of survival irrespective of how badly oiled it is. If a bird lacks these symptoms, it may not be starved or have had time to preen and therefore swallow much oil, and the following treatment may be attempted. Success depends on care being paid to detail at all stages.

Preliminary treatment
An oiled bird is probably sick and in shock. It should be approached slowly and cautiously and handled with care.

The sooner treatment begins, the greater the bird's chances of survival. Nevertheless, an oiled bird should not be washed immediately (this can wait for two or three days); the most urgent priority is to overcome the effects of shock by keeping it warm, quiet, and fed.

- To keep the bird warm, stop it struggling and swallowing even more oil by preening, wrap it in a dry cloth so that only its head and feet are free.
- Place it in a cardboard container in a warm draught-free place. The bird should not stand on a hard surface but on rags or foam rubber which should be replaced and cleaned regularly. Do not use hay, straw or any similar material as these can give the bird a fungal infection.
- Begin feeding as soon as possible. At first, force feeding may be

necessary. The energy restorative recommended under 'shock' may be used.

- Regularly smear a seabird's feet with a thin layer of handcream or medicated ointment to prevent drying or callousing.

Cleaning

Cleaning must leave a bird with water-repellent plumage. The best cleaning agent is a mild liquid dishwashing detergent.

1. Prepare a 1% solution of washing-up liquid in a tub of hot water. This is about 100 ml detergent to 10 litres water (¼ pint to 3 gallons). It should be hand-hot (40°- 45°C). Note: Do not deviate from these temperatures or use a stronger solution, otherwise its effectiveness in removing the oil will be reduced.
2. Immerse the bird up to its neck for about 10 seconds to allow full penetration of the oily feathers. Agitate the plumage in the solution. Rub all oiled parts and separate the feathers to allow complete soaking. The head and area around the eyes can be cleaned by gentle use of a soft toothbrush dipped frequently in the solution.
3. Transfer the bird to a fresh bath of detergent solution at the same concentration and temperature as the one before. Continue washing until all oil has been removed. A third bath may often be necessary.
4. MOST IMPORTANT. Thoroughly rinse the bird with hand-hot water (a hair-rinsing hose is ideal), jetting it strongly into the plumage and ensuring it penetrates to the skin. Continue until the bird no longer looks completely waterlogged, and the water begins to pearl off it in drops. This must occur over all parts of the plumage. Note: All traces of both oil and detergent *must* be removed if the feathers are to regain their waterproofing. Rinsing therefore, must be particularly thorough and may take some time.
5. Dry off with a clean cloth gently stroked *with* the feathers and place near a source of mild heat. When dry, the bird should remain in a warm, draught-free place for about 2 hours before being transferred to an outside pen.

Thoroughly rinse the bird . . .

Aftercare

- For the first few nights the bird may be placed under shelter and given some heat, but it should be hardened off as soon as possible.
- Ensure that the bird has access to a bath or pool of clean water and that its surroundings do not become soiled or muddy.
- An unwilling bird must be encouraged to enter the water. When it is seen to be able to spend a considerable time on or in the water without wetting, and to emerge as dry as when it entered, it may be released in a suitable, safe locality.

Feeding

The harmful effects of shock and sudden confinement can be greatly minimised if a bird can be persuaded to accept nutritious food as early as possible. A few drops of vitamin premix, of the type commercially available for children, will often revive an ailing bird, and can be placed in either food or water. Although a bird may refuse to eat, it will seldom refuse to drink, and a supply of glucose in the drinking water may also provide sufficient energy to sustain it temporarily. A bird cannot live long without food, however, and if it does not voluntarily begin feeding within a few hours, it should be force-fed.

Force feeding
Gently prise the beak open with one hand and, with a pair of tweezers or a syringe in the other, deposit a small quantity of food at the back of the bird's throat and on the top of its tongue (never beneath). Close the beak and encourage swallowing by softly stroking the throat. If the bird is inclined to struggle it should be restrained by wrapping it in a cloth. Two people may be needed to handle larger birds conveniently.

Feeding hardbills
'Hardbills' – i.e., finches and buntings – are all mainly seed-eaters. In captivity, they may be fed on a variety of cagebird seeds, either mixed, or given 'cafeteria style' in separate containers to allow a bird to choose its own preferences. Cage-bird grit should also be supplied. Supplementary foods include crushed oats and sunflower seeds, fresh apple or orange, cheese, a few live insects occasionally, and the following plants with roots and soil still attached: dock, rauriki, all seeding grasses, shepherd's purse, greater and lesser plaintain, chickweed, willow weed, wild turnip, and dandelion.

Feeding softbills
'Softbills' – i.e., blackbirds, thrushes, and all other birds which in a wild state feed mainly on insects, fruit, and berries – should be fed on as wide a variety of insects as you can find. Prior to feeding, slow down live insects by placing them in a refrigerator for about five minutes. The following mix, served dry, should also be given:

1 cup breadcrumbs and ground arrowroot biscuits
¾ cup skim milk powder
4 table spoons wheatgerm
2 table spoons Brufax (Pasteurised yeast)
1 level teaspoon of iodised salt

Other alternatives are canned dog foods or dampened, commercially-available guinea-pig pellets.

As a change, provide raisins, diced cheese, crumbly, hard-boiled egg, fruit cake, vegetable scraps, and natural fruits that the bird might normally eat. A light smear of butter on an item of artificial food will often encourage the bird to eat it.

Feeding honeyeaters

The true 'honeyeaters', which are more correctly known as nectar-feeders, are represented in New Zealand by the tui, bellbird, and stitchbird. All are largely insectivorous. In captivity, nectar-feeders should be provided with softbill fare, various berries and fruit (cut oranges, plums, etc., plus canned fruit juices) as well as the following nectar mixture:

½ litre boiling water
2-4 tablespoons of honey
¼ teaspoon of Hepamino (liver extract) or Minamino compound
2-4 tablespoons of Complan
2-4 tablespoons of Farex

An alternative mix consists of rice, well-boiled in milk until soft and sweetened with sugar, honey, jam or treacle. Kowhai, rata and other nectar-producing blooms should also be given when procurable.

Feeding flesh-eaters

Hawks and owls may be fed on raw meat, mice, and large insects. These birds eject the indigestible parts of their prey as pellets, and consequently require roughage. If raw meat alone is fed, roughage can be provided by wrapping the meat in dog hair (or other available fur) and including strips of cuttlefish bone to simulate animal bone and

provide additional calcium. If the pellets are too moist, more roughage is needed.

Feeding waterfowl
Ducks, geese, and swans may be given a mixture of wheat and poultry pellets with a little greenfood added. Pond weeds may be given to geese and swans which also benefit from an opportunity to graze grass.

Feeding seabirds
Gulls may be fed household scraps including, in an emergency, tinned cat or dog food. Fish and shellfish are eagerly accepted. Shags and penguins are more particular and can only be fed with real safety on fresh, or recently thawed frozen, fish. For the first day or so strips of filleted white fish should be offered then, later on, any available small, whole fishes.

Feeding young birds
The golden rule when rearing a young bird is to feed little and often. Offer it food in the manner its parents would until you see it feeding itself. Protein is very important for young birds and insects are the best diet for most. As the bird develops, gradually wean it onto the outlined adult diet.

Constipation and diarrhoea
Constipation can often be relieved by dissolving a pinch of Epsom salts in a little water and administering with an eye-dropper or syringe. A little cold milk may also be given as well as grated cold boiled carrot, sweet apple, pear or banana, or other greenfood where appropriate. If the abdomen is swollen or inflamed, very lightly smear with tincture of iodine.

For diarrhoea, which is usually an indication of some digestive trouble, give a couple of drops of warmed castor oil (or olive oil) direct into the throat to clear the digestive tract; withhold food temporarily. Try a change of diet. If either complaint persists, seek professional advice if possible.

Water
Young birds normally do not need much water until they are feeding

themselves. One or two drops from an eye-dropper after each feed will usually suffice. All adult birds must have daily access to fresh water. Shags and penguins should be given salt water to drink whenever possible, but gulls may be given either salt water or fresh water.

Obtaining insects
Apart from what a search around the garden may yield, live-food is obtainable in the following ways:

- Supplies of moths can easily be collected by attracting them to a night light.
- Arrange a piece of fine gauze at the bottom of a medium-sized dish of water in the garden. Throw in a dessertspoonful of fertilizer occasionally and lift the gauze to obtain a useful supply of small insects when required.
- To obtain a supply of gentles (bluebottle larvae) suspend a piece of offal, held by two skewers, from a large fruit tin minus its top and bottom. This tin should be placed upside down over another tin of similar size containing bran to clean the gentles as they fall from the offal.

Footnote

Resist the temptation to stroke and pet an invalid bird, especially a young one. As your main purpose is eventually to be able to restore it to the wild, you should not attempt to tame it – and thereby prejudice its chances of survival by removing its natural fear of man – nor keep it any longer than is necessary for its recovery. A bird can quickly become attached to a benefactor, and may pine and die on release, or embarrass you by returning.

FURTHER READING

BATES, HENRY, and BUSENBARK, ROBERT, *Finches and Soft-billed Birds,* T.F.H. Publications, 1970.

STROUD, R. ('Birdman of Alcatraz') *Stroud's Digest on the Diseases of Birds,* T.F.H. Publications, 1970.

KEEP NZ CLEAN
LOOK AT THAT LITTER BUG. DONT BE LIKE HIM PLEASE!
Potato Chips

Publicity

The acceptance of the idea of conservation, and the success of conservation activities, depend very largely on information and education. Once a proper climate of opinion is established, half the battle has been won – which is why it is so important to make the most effective use of the various publicity media available.

- You may want to start an environmental group, or bring an existing group more to the attention of the general public and increase its membership.
- You may need volunteers to help in some activity such as a tree planting or a clean-up project.
- There may be a development scheme which you consider threatens the quality of your environment and which you wish to oppose by rallying public opinion behind you.
- You may want to encourage people to attend a public meeting, view a display, or simply think about conservation.

In all these matters and in many others, publicity should be carefully planned to ensure that you obtain the maximum results for the time and effort you expend.

Personal contact

The simplest and most basic form of publicity is personal contact. By talking to people, your friends, your work associates, you can influence

them – and this is an excellent first step in forming favourable attitudes or changing unsympathetic opinions. There is no need to become an 'eco-bore', but you can at least start people thinking about the environment, what is being done to it, and the part they are playing or can play. There is, however, a limit to the number of people you can talk to personally.

The Press

The printed word is the most lasting way of getting a message across. Most people read a paper and look for local information in district papers. Used with discretion, the press can be an important ally.

Newspapers are not charitable institutions. In most cases they are concerned with making money, and on many occasions you will have to pay for publicity – to advertise a speaker or a public meeting, for instance.

There are, however, at least two points in your favour: conservation is recognised as a worthy cause, and conservation activities are usually newsworthy. So, if you come up with a good initial idea and manage to arouse the interest of the media or advertisers, you may obtain your publicity free.

You may be able to interest a newspaper in running a supplement. This means that the paper would find advertisers prepared to pay for space, and there would consequently be room for conservation articles, pictures, and for the coverage of local conservation activities, at no cost to you.

A word of warning. Advertisers are usually sincere in their desire to do something positive to help the environment; but it can happen that some may regard sponsorship as a useful means to divert attention from their own particular environmental bad practices. In order to avoid criticism, therefore, it is a wise policy to examine carefully the motives of potential sponsors before accepting their help.

Always let the media know of conservation happenings, and remember – not all news need be bad news; people like to read for a change about something constructive which is being done for the community. However, don't make the mistake of trying to oversell relatively minor news items.

When preparing a press release keep it short and snappy. The briefer it is the more chance it has of being read and making an impact. Begin with the important, telling features, and follow with details. In this way, should there be insufficient space for the entire release, the end can be cut without seriously affecting the aim of the story.

All releases should be typed, using only one side of the paper, and double spaced. Keep a copy for your own reference.

If you require coverage of an event or meeting, a reporter should be asked to attend and you should provide him, if possible, with brief background notes and with the text of any speeches to be made. Although this courtesy is not absolutely necessary, it is usually welcomed and helps to eliminate misinterpretations and misunderstandings. You can, of course, issue your own press release which you can restrict to prevent its being used until the appropriate time; but papers generally prefer to write their own stories.

Also, you may organise a photographer to be present. He can arrange for the pictures he takes to be made available to any newspapers you wish.

Try to make contact with a particular reporter on a newspaper (or in T.V. or in Radio) and especially with one who has a personal interest in conservation. This means that you can both begin on common ground and by speaking the same language, which will greatly assist in establishing a relationship based on trust and understanding. And though it won't obtain coverage for you when an item has no news value, it *will* help to ensure that you receive a fuller and more sympathetic treatment of anything which is usable. Also, a reporter who is already familiar with the principles of conservation can help you to select material which has reader interest and appeal.

Newspapers and magazines will accept suitable articles from members of the public provided these are topical and not too long. It is often advisable first to contact the editor or features editor to make sure that there is interest in the type of article you have to offer. Good illustrations nearly always help in selling a story.

Radio and television

The characteristic quality of radio and television is their immediacy.

They convey ideas more vividly than does the printed word, and personalities tend to come across better, often adding much weight to a message or an idea.

Radio can reach more people than the press, particularly if the national programme is used; economically, it can be more profitable (no one may read your newspaper advertisement, which means you have lost whatever money you have spent on it; for a comparable expenditure you can repeat a radio advertisement).

Television is the best medium of all for getting a message across. It is, however, very expensive, and every second of time purchased must therefore be used to the full. The great advantage of television is its penetration, as it covers virtually the entire country and enters into homes.

If you can arrange for extended coverage or for an interview on either radio or television (or both) this is all to the good. You may even, at times, be able to persuade a producer to devote a programme, or at least a large part of one, to a particular aspect of conservation.

Press releases can be prepared for radio and television in much the same way as for the newspapers, and reporters from these media can be invited to cover various activities. Sponsored advertising, along the lines mentioned under 'Press', is also available.

Both radio and television provide excellent opportunities for making succinct, hard-hitting arguments; but for a fuller treatment of any issue, the written word is better. It should also be remembered that the appeal of these two media is not lasting, and that what is said through them may be forgotten more quickly than if presented in another form, or may not register at all.

Publications

After having had your say on radio, television, or in the press, you have not exhausted all means of publicity.

You may decide to eliminate the 'middle man' by issuing your own newsletter, news sheet, pamphlet or brochure, and to find your own distribution outlets.

The main benefit in this type of printing is its saturation. For

example, a small pamphlet can be mass produced inexpensively. But remember, we live today amidst a veritable snow storm of pamphlets and brochures, which can themselves be contributing to the very pollution we are trying to help eradicate. Make sure then that what you have to say warrants the consumption of more paper.

Newsletters or news sheets, even simple ones which can be produced quickly, are very useful as a means of advising members of your group about coming events – and it is essential that all members be kept well informed. A pamphlet explaining the objects of your group may be of value, and all publication, where appropriate, should be made available to the media.

It is essential that whatever is produced in this field be eye-catching, otherwise the public will probably not bother to look at it.

Pictures

'One picture is worth a thousand words'. Take your own pictures, look for them, and be ready to suggest subject matter. A contrast of pleasing, scenic shots with others showing environmental despoliation can have a big impact, especially if they are recognisably local or New Zealand scenes. People know such things happen overseas but are frequently unaware of the bad examples occurring in their own country.

Posters have great visual effect, so why not have some made? Why not run a poster competition or a photographic competition? These could be organised in co-operation with local schools or other groups.

As well as for reproduction in the press, in magazines and on television, pictures can be used as part of displays in libraries, museums, and shops. Most people like to associate themselves in some way with a good cause, and if you provide some decorative material they may do so and brighten their premises at the same time.

Displays

A wide selection of material can be used for displays. Pictures should

and will usually predominate, but you can also include posters, maps, attractive headings and text, models, and almost anything else you can think of.

Some form of recorded commentary or sound effects can be used to establish background atmosphere or provide additional information.

Try enlisting the help of artists, art students, photographers, model-makers, local firms, government departments and indeed anybody who you feel may have something to offer. It is surprising how much good material accumulates once you start looking for it.

Screen advertising

Screen advertisements and screen signs featuring, for instance, an effective conservation scene with a pithy, brief caption are cheap to produce and can be displayed in cinemas throughout the country. This technique is well worth while considering, in view of the gradual resurgence in theatre patronage.

Films.

Although this is a specialised field, it is an excellent way of reaching the public, particularly youth.

Ask local amateurs to make a film on local conservation. An audio-visual display, using slides with two or more screens and projectors and employing a tape-recorded commentary, can be extremely effective and can provide something of the impact of a moving picture.

Lectures

Arrange for a visiting speaker, or someone in the district with local knowledge, to present a lecture – preferably in conjunction with slides or other visual aids. Correct publicity is vital to ensure worthwhile attendances.

Debates, panel discussions, and seminars can also provoke interest and provide information, but they need to be carefully organised. If

people well known in certain spheres (academic, theatrical, broadcasting) can be encouraged to take part, this will arouse considerable additional interest and boost attendances.

Meetings

Meetings should be relevant, reasonably brief, and as interesting as you can make them. It is often preferable to schedule a meeting of your group only when there is sufficient business to discuss, rather than regular meetings merely as a matter of routine.

Coincide well-advertised public meetings with times when you can arrange for worthwhile entertainment to make them more enjoyable and memorable.

Field days

Run field days during which you can invite the public to see conservation problems and activities for themselves.

Organise an excursion in your district to examine some of its environmental problems. Even simply run 'nature study' expeditions can be fun, educational, and can encourage environmental awareness as well as recruiting new members for your group.

General

Information should be made available to all media as soon as possible. Always give ample warning of meetings, projects, etc. It often pays to double-check that people are aware of forthcoming events, even if you know they have been notified previously.

Be fair. If you are dealing with competing news media – two newspapers, for example, or one newspaper and radio – the only equitable course of action is, as far as possible, to release material to each in turn. However, if a reporter suggests a story he would like to do, this should be regarded as exclusively his, and it would be a serious breach of faith to hand it over on a platter to his competitors.

Always put forward a balanced and rational viewpoint; personal

attacks, emotional outbursts and similar lapses in control defeat their own purpose. This does not mean, however, that there is any need to pull your punches on important issues. Before you say anything, make sure you have the facts.

. . . personal attacks
. . . defeat their own purpose.

Interested organisations

Your area probably contains more people than you realise who would be prepared to assist with conservation activities and publicity and who have posters, photographs, and equipment to offer. Why not contact some of the following organisations and let them know what you are doing or would like to do, and how they might be able to help?

Scouts and Guides are two most important groups which take a keen interest in conservation matters.

Schools can also play their part. Primary school teachers often promote project work on conservation, and there is plenty of scope for secondary school teachers to encourage pupils to take an interest in the more ambitious conservation projects.

Acclimatisation Societies often have expertise which they are prepared to contribute, and have knowledge of the special needs of their district.

Conservation Societies. These are obviously useful and contact should be made and continued and information exchanged.

Churches can take an active role both by stressing man's moral obligation to look after his environment and by encouraging conservation projects, where possible, on church land.

Other bodies which may be prepared to give of their time, materials, or knowledge are branches of the *Royal Forest and Bird Protection Society,* and *Ecology Action* groups which have their centres in universities (interested university staff and students may also be recruited individually).

Government departments and agencies which can be called upon include the *Wildlife Service, Department of Lands and Survey, National Parks and Reserves Rangers,* the *Forest Service, Catchment Boards,* the Water and Soil Division of the *Ministry of Works,* and *Borough and County Councils.*

Business firms may be prepared to sponsor projects, or advertisements in the press. *Lions clubs, Rotarians, Zonta,* and other similar service groups can also be approached.

Legal rights on environmental issues

Laws and ownership

Although much of our present law was not made for the special purpose of protecting the environment it can still be used by the private citizen for that purpose. This is because there is quite a body of law which protects a person's private property or enjoyment of that property from being unduly interfered with.

Public property and control

Much of the 'property' likely to be adversely affected either belongs to the Crown (public reserves, State forests and so on) or is subject to regulation by the Crown (natural resources such as minerals, for example).

This ownership or power of regulation by the Crown is usually conferred on a particular government body by an Act of Parliament which often gives a good deal of discretion to the body in the way in which it carries out its functions.

If anyone has good reason to think that the body is carrying out its functions in excess of its statutory authority there are legal remedies that can be sought, under which the Courts can direct that the actions of the administering body should be brought back into line with the intentions of the act it is supposed to be administering. Such remedies as 'mandamus', 'certiorari', 'declaratory judgement', or 'motion for

review' are as complex and technical as they sound, but in certain situations and with good legal advice they can provide the means for the private person to question and remedy through the Courts the wrong decision-making of bodies that could otherwise appear to be all-powerful.

In other cases – the Water and Soil Conservation Act and the Town and Country Planning Act, for example – the private person does not have to go through these complex procedures. These types of acts provide specifically for the right of private persons to object and those objections must be heard and taken fully into account.

An ordinary person can do a lot for environmental protection by knowing his rights under statute. It is possible to buy the relevant acts from the Government Printer and to read those sections that set out your rights. A list of legislation concerned with the control of the environment can be obtained from the Commission for the Environment.

Your own property

As far as your own property is concerned, a body of protective law has been built up from the decisions of the law courts over many years.

i) *Negligence.* This 'common law' makes it clear that individuals and their property should be protected from harmful results arising directly (and not too remotely) from someone else's carelessness in either doing something or failing to do something, in breach of a duty to be careful, known legally as 'the duty of care'. This is covered by the law of negligence. Legal advice on this would be quite essential.

ii) *Private nuisance.* A person has the right to take action against anything for 'private nuisance' if he has suffered unlawful interference with the use and enjoyment of his land. The aggrieved person would need to show that the interference is continuous rather than an odd isolated incident; that the interference is quite out of character with the nature of the surrounding neighbourhood; and that he is not an unduly sensitive person. Again, legal advice would be absolutely necessary but if the aggrieved person wins his case he can get monetary compensation for any proven loss and can ask the court to grant an injunction which forbids the continuation of the nuisance.

iii) *Public nuisance.* Anything that obstructs or causes inconvenience or damage to the public in the exercise of rights common to all people may constitute a public nuisance. Public nuisance is a crime and an offender can be prosecuted by the Crown. If any person can establish he has suffered special damage (i.e. damage greater than suffered by the public in general) he may have a common law action for damages or an injunction.

The action for nuisance is one of the few common law actions potentially well suited to environmental protection. It may be used to control such things as unreasonable noise, fumes, smoke, or other disturbances of the enjoyment of land. It is important to remember, however, that in common law actions, facts are argued and the Court is not restricted by the words of any statute. It is also possible that certain nuisances may be authorised by statute (e.g. a right to discharge effluent into water which passes through your land) and it will not be possible to assert any common law right you might otherwise have had.

. . . unreasonable noise . .

iv) *Dangerous escapes.* If a person creates a danger by bringing on to his land anything likely to be dangerous if it 'escapes' (or flows or passes) from his land, he is liable for the damage caused if it does so 'escape'. However, this action is rather limited these days because if it is 'natural' to use the land for a dangerous purpose the owner need not be liable for the escape. The action was effective in the early days of industrialisation (when it wasn't so natural to use land for industry) but these days much land is 'naturally' used by industry to create potentially dangerous situations. So this part of the law is not of much use except in various special circumstances.

v) *Breach of statutory duty.* Some Acts of Parliament impose a duty on persons to do or refrain from doing something. If it can be established that Parliament in the particular Act, intended to confer a right on private people to take action in the Courts to enforce the carrying out of that duty then they can take that action. But in many cases, especially in the field on environmental matters, the particular Acts have not provided the scope for this action (although it has been used quite widely in association with the factories legislation).

Therefore, while we have no comprehensive environmental law, there are a number of rights under various Acts, as well as rights of an individual owner of property under common law. In most cases, except where your rights and procedures are very clear under the Act (such as a right to object on town planning matters), it is essential to take legal advice in this highly complex field of law.

Further action

Draw up a petition

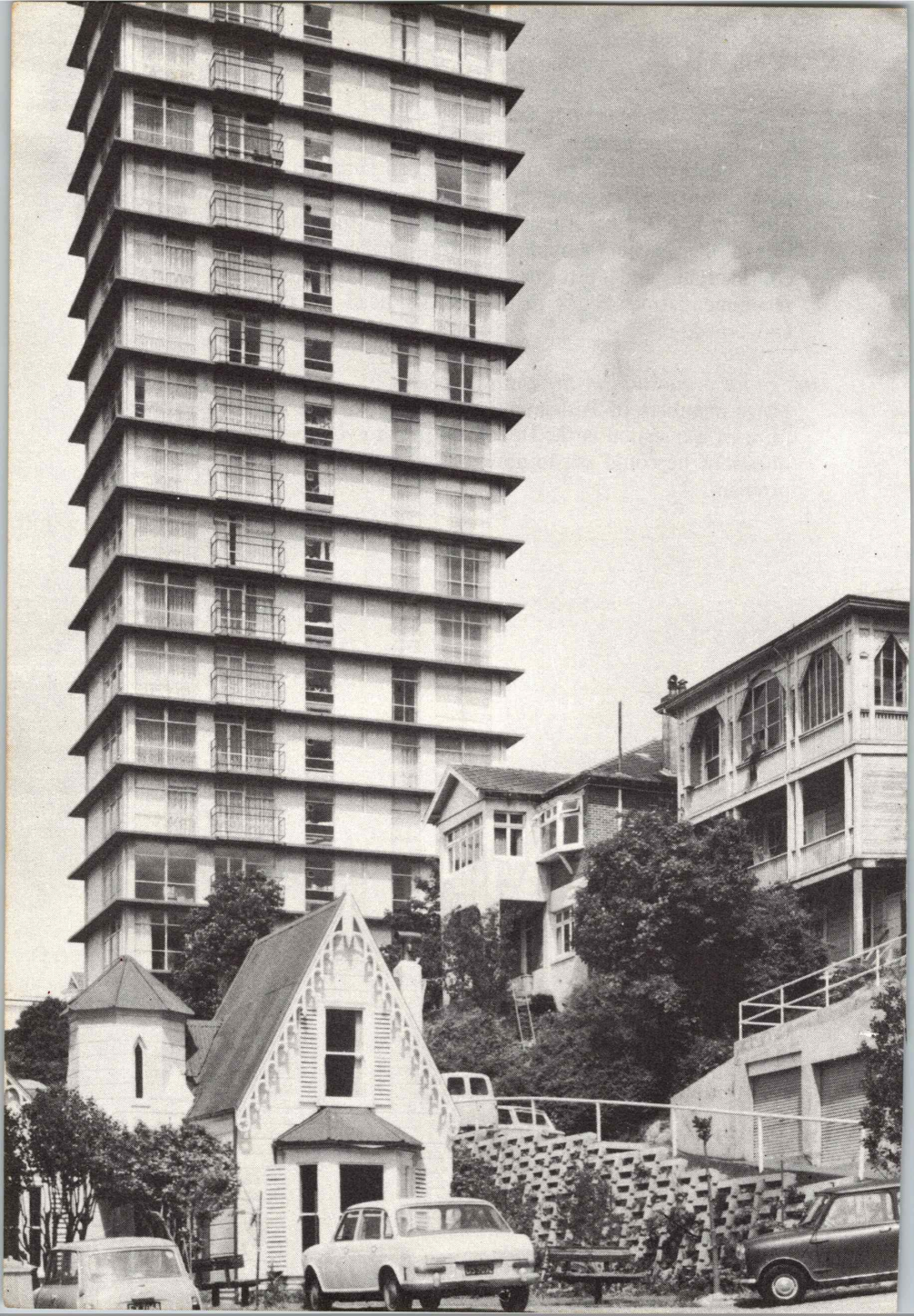
- Anybody can prepare and submit a petition to Parliament. Ask your local member for a copy of the printed form giving the setting out and rules. Give people the facts, get them interested, ask them to sign (make sure the signatures are genuine and are not repeated).
- When the petition is ready arrange for your member of Parliament to submit it to the House. It will go to the Petitions Committee who will consider its merits and report back to Parliament – it can result in legislation.

Write to the Ombudsman

- The Ombudsman can investigate administrative actions of government departments. If you think something has not been properly handled by a department write to the Ombudsman. If he thinks the matter should be taken further he can conduct a confidential and informal inquiry which may lead to a recommendation being made to the head of the department concerned.

Arrange for a question in the House

- Many members of Parliament are willing to raise an issue in the form of a question in the House. Suggest to your local member the questions he could ask to draw the attention of the House to the problem.



Town and country planning

Why plan?

When New Zealand was first settled, people lived mainly in rural areas and farmed the land. The few towns which existed were relatively small and conditions were not overcrowded as they were in Britain where many of the settlers came from. Nevertheless houses, factories, and other buildings were erected wherever sites could be obtained and little consideration was given to the effects of mixing these uses.

As the towns began to grown, problems became evident. The demand for land to house an ever-increasing population meant a steady reduction in the land available for farming. Growth had to be directed away from land with valuable farming soils. The distance between housing areas and employment areas increased and along with it the amount of traffic on the roads travelling from one to the other. At weekends and during the holidays people sought relaxation away from the towns, at beaches, and other resorts, and this in turn brought problems of accomodation, parking, and litter.

Town and country planning tries to solve all these problems and to choose a course of action which will be of the greatest benefit to both the individual and the community. In this sense planning is no different from the process applied by many others in different fields, whether it is the Government in the selection of ways to direct the economy, or an individual in deciding how to budget for a new car and still afford a holiday. Planning is simply a method of deciding upon a future course of action and involves:

1. Working out what the problems are and deciding present and future goals.
2. Thinking of ways of solving the problems and reaching the goals.
3. Putting the best ideas into action.
4. Having a look, after a time, to see whether the ideas put into practice are working and whether any change is needed to meet new circumstances.

Aims of town planning

It is not always possible to isolate all the problems and say there is only one correct solution. Very often there will be a number of alternatives with different advantages to choose from. The selection of any one solution must depend upon values held and expressed by the community, and on these not everyone will necessarily agree. For example, it may be a choice between preserving a lake in its natural state or flooding it to create a reservoir for water supply or power purposes.

You may have thought that town planning is a process whereby a new city is created – such as Canberra in Australia. This is not usually the case. In fact few planners get the opportunity to start with a 'clean sheet'. Most are concerned with the problems which have developed over the years, a heritage of unrelated building development, traffic congestion, and pollution. The function of the planners is to guide the growth in such a way that is contributes to the achievement of the community's overall objectives for the area.

Here are some goals which the planner might advocate for adoption by the community:

1. Land should be used for its best purpose. In New Zealand there are pressures to use highly productive farmland for housing, but this pressure must be resisted as the country is so dependent on the sale of primary produce overseas.
2. Housing areas should not only be adequate for people's physical comfort and covenience, but should incorporate the schools, libraries, Plunket rooms, play centres, churches,

. . . a heritage of unrelated building development . . .

recreational and sports clubs, without which it is difficult to develop a real community.

3. People must be able to move easily and quickly from home to work, to shops, and to places of entertainment.
4. Development should be carried out to look as attractive as possible.
5. Unpleasant uses should be segregated from other uses. For example it is usually undesirable because of the traffic and noise to place a commercial garage in a residential area.
6. Buildings which are to each other's mutual advantage, such as shops and community uses, should be grouped together.

In endeavouring to achieve these goals, the planner is constantly trying to seek a balance between the rights of the individual and the well-being of the community, within the framework of the law.

Who is responsible?

- The Minister of Works administers the Town and Country Planning Act 1953.
- Regional planning authorities prepare regional planning schemes.
- County, borough, and city councils prepare and administer district schemes for areas under their jurisdiction. In doing this they have regard to the provisions of regional planning schemes.
- Ad hoc local authorities such as harbour and hospital boards have power to see that provision is made for their developments in district and regional schemes.
- The town and country planning appeal boards hear appeals arising from the decisions of county, borough, and city councils.
- Special interest groups such as progressive associations, environmental groups, and chambers of commerce can act as pressure groups to promote the interest of those in a particular locality or sector of the community. Individuals act to promote and safeguard their own interests.

How do we plan?

Planning is undertaken at two levels: regional and district.

Regional planning
The Regional Planning Authority is composed of representatives of all the local authorities in the region and it has the responsibility of preparing a regional plan. The purpose of such a plan is to:

i) Deal with the development of the region as a whole, co-ordinating activities which affect more than one district.
ii) Provide a guide to county, borough, and city councils in the preparation of their schemes.

At present regional planning covers Northland, Hamilton, and Marlborough in addition to the four main centres. Regional plans deal with broad issues only, and the individual citizen is not directly involved in regional planning.

District planning

Every county, borough, and city was required to produce a planning scheme for its district by the beginning of 1971.

The purpose of a district scheme is to develop the area within a county, borough, or city so that it will promote and safeguard the health, safety, and convenience and the economic and general welfare of the people living there. A district scheme comprises:

- The Scheme Statement, which outlines the council's policy for the development of the area and explains the provisions in the district scheme.
- The Code of Ordinances, which are the bylaws indicating what an owner or occupier can or cannot do with his property.
- The District Planning Map, which sets out how the land is to be used in the future.

The scheme should cover:

1. The policy of the council and how the goals of the plan are to be achieved over the planning period.
2. How the resources of the council are to be allocated.
3. How the land is to be used.
4. How the provision of utilities and services is to be related to the growth of population.
5. How the environment is to be improved.
6. How the means of communication and transport are to be improved and maintained.
7. When the land is to be developed.

Often these schemes generate a good deal of interest and debate while they are being prepared and they capture local newspaper headlines every now and again.

Goals that both regional and district schemes commonly endeavour to achieve are growth, renewal, and conservation.

Planning in operation

District schemes seek to provide a desirable type of environment by way of such techniques as zoning, designations, and the programming

or timing of development followed by periodic reviews of progress.

Zoning

The purpose of zoning is to indicate the way in which land may be used. It ensures the success of two of the main planning goals – the separation of incompatible uses and the grouping together of similar or mutually dependent activities. Land is zoned for one of four main purposes: rural, residential, commercial, and industrial. Where necessary these zones are further subdivided. For example there may be a residential zone for single-unit houses and another for flats and apartments. In the code of ordinances the particular uses acceptable in each zone and the conditions attached to each use are laid down.

Designations

Land which is used for any community purpose or public work is designated or shown as being set aside for the specific purpose in the scheme, e.g., reserves, civic buildings, and roads. Not only are existing facilities shown but also future sites required to serve the needs of a growing population. Government and local authorities work out what services are needed and then require that the council make provision for them in the scheme. Obviously the facilities that can be provided will depend upon the availability of finance, but the priorities will have to be set by the community which is directly concerned.

Timing

A district scheme is normally prepared to cover the next 20 years and forecasts are made of the needs during this period. Detailed proposals are then drawn up of the action likely to occur in the first 5-year period and other stages are laid down. The purpose is to take in and ensure an orderly progression of development. For example, necessary services such as water, sewerage, and schools must be provided to keep pace with the construction of housing.

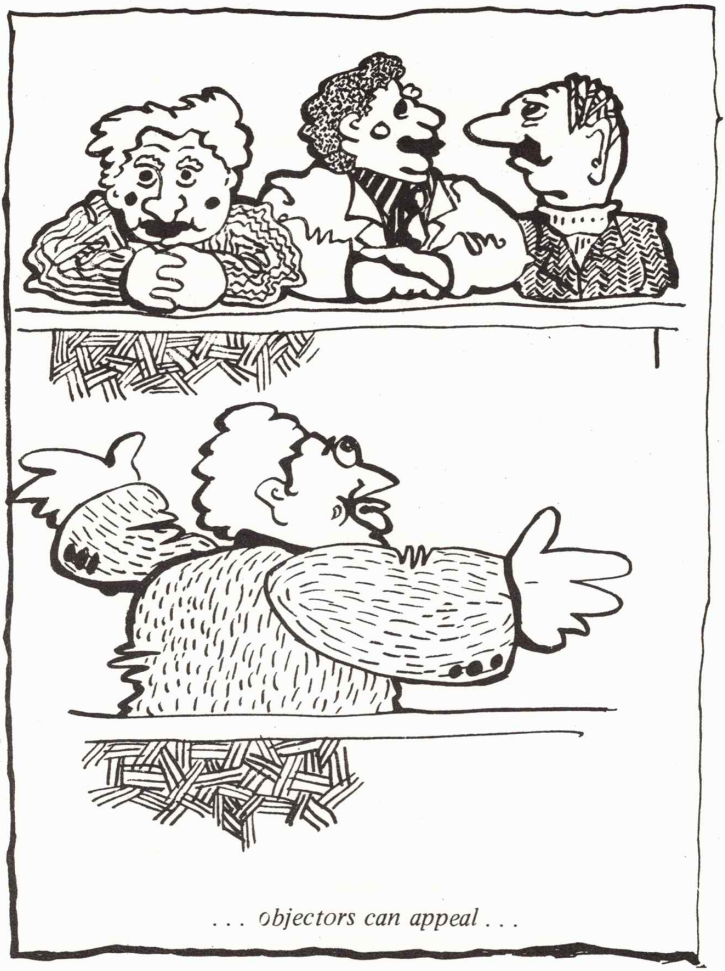
Review

After a district scheme has been in operation for five years the council is required to undertake a review. The review follows much the same pattern as the original preparation but is designed to take into account changing circumstances and progress already made in carrying out the

proposals. Adjustments and modifications are made as necessary. In many towns, reviews of the district scheme are already underway, and this should afford greater opportunity for participation by the public in the preparation of the planning scheme, as many councils now realise the value of releasing draft proposals for comment and discussion.

How a district scheme is prepared

1. A council announces that it is going to prepare a scheme by placing a public notice in the newspaper, and proposals are sought from local authorities in the area, such as hospital boards, harbour boards, councils, the regional planning authority, and the Crown. Any person may go to the council at this stage and present any ideas he may have for inclusion in the scheme.
2. A scheme is then prepared, either by the council's technical staff or by private planning consultants. This is the draft scheme.
3. When the draft scheme is ready it is then sent to the local authorities, the regional planning authority, and the Minister of Works, asking them whether they want to have provision made in the scheme for public works, such as schools, hospitals, electricity substations, airfields, or motorways. They make their requirements known.
4. The council incorporates these requirements and makes any modifications necessary before recommending the scheme.
5. The scheme is then made public and everyone is given the opportunity to consider it. This is the proposed scheme.
6. If any person considers that a provision of the scheme harmfully affects his property, he may lodge an objection with the council. Other public and private bodies can also object, either in respect of their own property or in the public interest.
7. The council is required to publish a summary of all objections. People claiming to be affected have the opportunity of opposing or supporting any objection.
8. The council then holds a public hearing for those who have lodged objections.
9. The council may allow objections in which case changes are made to the scheme. If however objections are disallowed, objectors can



. . . objectors can appeal . . .

appeal to the Town and Country Planning Appeal Board. After the hearing of appeals some changes to the scheme may be necessary resulting from the Board's decisions.

10. The scheme is finally approved and becomes operative. When the scheme is operative, the council and all owners and occupiers of property and organisations are bound to comply with its provisions. The scheme is subject to review after being operative for five years.

Planning control

It would be impossible to explain all of the terms and procedures of the Town and Country Planning Act but the following paragraphs mention some of the more significant with which the ordinary property owner may be concerned.

Change of use
Before the district scheme has been prepared the Act requires that the council's permission must be obtained for any change of use of land. For example, if you wanted to change your house into flats this would be a change of use. This may be refused if it is thought harmful to the area. The council has also been given other powers to ensure that during the preparation of a scheme no change of use will occur that might prejudice the scheme later on. Once the scheme is produced and becomes operative then all changes of use become subject to it.

Predominant use
This is a use which is listed in the code of ordinances as acceptable for that particular zone: that is, no specific consent from the council is required, although a building permit would of course still be needed. Examples might be farm dwellings in a rural zone or houses in a residential zone.

Conditional use
Some uses may be generally acceptable in a zone but not necessarily on all sites, or only subject to certain conditions. Such uses are listed in the Code as Conditional Uses for that particular zone. The specific consent of the council is then required and the council may refuse its consent where it considers the particular site unsuitable or because of the likely effect upon the neighbourhood. The important point is the procedure

under which adjoining property owners and other parties are given the right to object and be heard before the council decides the application. Where the council refuses consent or imposes conditions which are not acceptable the applicant and any objector have a right of appeal.

Specified departure

A planning scheme cannot be expected to cater for every situation which might arise, and provision is made for any person who wishes to carry out any development which is contrary to the scheme to apply for a specified departure from the district scheme. The council may consent only where the matter is of a minor nature and does not affect the general intentions of the scheme. The consent relates only to the one piece of land. Again, the procedures provide for the right to submit objections to the council and give both the applicant and objectors a right of appeal.

Change

Sometimes a completely new situation may arise which was not foreseen when the scheme was prepared. The council may then give notice of its intention to change the scheme in part. This may be necessary to allow a particular project to go forward. For example, it may be necessary to provide more residential land in a rural area. In addition, a change may be needed to strengthen the control over some new type of development in an area.

The procedure is largely the same as for the preparation of the scheme with rights for the individual to object and appeal.

Appeal

This means an appeal to the Town and Country Planning Appeal Boards set up under the Act. The boards consist normally of three or four members who listen to submissions and evidence presented by both parties – the appellant and the respondent – and then come to their decisions. Decisions of the boards are final except on points of law. The boards are given extensive powers to call evidence or to direct that amendments of changes be made to a district scheme, or to impose conditions on a consent as a consequence of the appeal. The appeal procedure follows usual legal lines and those involved are usually represented by a lawyer although this is not essential.

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Appendices

APPENDIX A

Land reserved for conservation

National Parks
Areas set aside as the National Parks Act says 'for the purpose of preserving in perpetuity as national parks for the benefit and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality or natural features so beautiful or unique that their preservation is in the national interest'. Parks are administered by National Parks Boards, which are subject to the general policy and direction of the National Parks Authority.

Maritime Parks
These provide for co-ordinated management under one board, of reserves of any type or other Crown areas on or off the coast and located within the boundaries laid down for the park. Many island reserves are included. Boards are serviced through the local Commissioner of Crown Lands Office, e.g., Hauraki Gulf Maritime Park – Auckland; Marlborough Sounds – Blenheim.

Scenic Reserves
These are on a smaller scale than National Parks and preserve native forest or other natural areas and allow access by the public to scenic features such as the seacoast, lakes, rivers, waterfalls, limestone caves, thermal areas, and scenic vantage points. Scenic reserves are administered by the local Commissioner of Crown Lands, the relevant local authority or, in some cases, a scenic reserves board.

Private Scenic Reserves
These are areas of scenic interest that, although reserved, remain in

private ownership and receive the protection of the Reserves and Domains Act 1952.

Flora and Fauna Reserves
Areas reserved under the Reserves and Domains Act 1952 that contain distinctive plant, animal, or birdlife of such importance that some control over public access is desirable. Access to them is therefore by permit only, obtainable from the nearest Commissioner of Crown Lands' office.

Scientific Reserves
These contain rare or unique features of plant or animal life and, in the interest of preservation, access is usually restricted to persons undertaking relevant scientific or research studies. They are administered by Commissioner of Crown Lands' office to whom applications for entry should be made.

Domains
Provide rural districts – and some city areas – with land, including community buildings, for the recreational needs of the people as a whole. Many domains are designed primarily to provide for organised sport, but there are a large number which preserve for use attractive natural areas particularly along the coastline, and provide facilities for camping. Native bush is protected on domain land. Universally known city domains are the Auckland Domain and Hagley Park, Christchurch. They are administered by the relevant local authority, constituted as a domain board, or by a domain board of locally elected persons or by the Commissioner of Crown Lands.

Historic Reserves
These mark the landfall and landing places of early voyagers such as Tasman or Cook, the sites of mission stations, of early fortifications or engagements during the Maori wars, and buildings and other sites of historic value. The Department of Lands and Survey, through the Commissioner of Crown Lands, co-operates closely with the New Zealand Historic Places Trust in the administration and investigation of historic sites. There are also a number of private historic reserves set up in the same manner as private scenic reserves (see above).

Other Reserves
There are many other types of reserves, including conservation, recreation, esplanade and some for a particular purpose like quarry, gravel, or racecourse reserves, set aside under the Reserves and Domains Act.

Water Supply Catchments
These are usually the catchment areas of a river or stream from which the public water supply of a local authority is drawn. Because of pollution and risk to public health there are, in some cases, restrictions on public access to catchment areas. Before entering an area used for water supply collection purposes, therefore, enquiries should be made to the local water authority which, in most cases, will be the local city, borough, or county council.

Wildlife Sanctuaries
Established to provide the maximum possible protection for areas, Crown-owned or private, of particular wildlife importance. At the present time most are off-shore islands. Entry is by permit only and restricted to people who have well-defined reasons such as relevant scientific research. They are administered by the Department of Internal Affairs under the Wildlife Act 1953.

Wildlife Refuges
Established to provide some protection for areas of wildlife interest.

In many instances the land is privately-owned. The main restrictions are that no dogs or firearms are permitted except those necessary to the landowner in the normal management of the land. Entry is subject to permission of the landowner. Administration is by the Department of Internal Affairs.

Wildlife Management Reserves
Established to protect areas which are managed and developed primarily as wildlife habitat. Entry and activities compatible with the main function of the reserve are permitted. Control is vested in the Minister of Internal Affairs but day-to-day management is often delegated to local organisations.

State Forest Parks
Areas of permanent State forest set apart under the Forests Act 1949 for public recreation, and for the preservation of the forest cover for soil and water conservation – which is the main object of management. In State forest parks, as distinct from National Parks, timber can continue to be harvested and measures taken for the replanting of the forest as required. The public has free right of access without permit, except when firearms are carried.

Forest Sanctuaries
Areas of State forest which are preserved as examples of natural vegetation, both for general and scientific interest. Forest sanctuaries have special legal protection to keep them as free as possible from interference. Access is restricted and they are not open for recreational use by the public.

Forest Recreation Areas
In certain State forests, areas of special scenic, botanical, or other interest can be set aside as recreation areas and appropriate facilities provided. Access for picnics, camping, etc., is unrestricted, except during periods of extreme fire hazard.

State Forest
This is land set apart under the Forests Act 1949 and administered and managed by the New Zealand Forest Service. Access to State forest, removal of timber, minerals and other produce, grazing, etc., are by permit only. Experiments are in progress which will determine whether, in the future, access to some State forests could be liberalised at certain times of the year.

APPENDIX B

Environmental organisations

The Nature Conservation Council

The Nature Conservation Council was set up by statute in 1962 to inquire into public or private works affecting areas of scenic or scientific interest. Consequently the Council is mainly concerned with specific problems and its officers make frequent visits to many parts of the country. Over a period of ten years the Council has acquired considerable expertise in its field, and its views are listened to with respect.

The Council reports to the Minister of Lands, but is independent from the influence of Government policy, and is able to publish its views.

The Council acts as a central body for obtaining and co-ordinating the views of persons and organisations interested in conservation. It issues a newsletter five times a year, as well as leaflets, and it sponsors the National Conservation Week Campaign.

Address: The Secretary,
Nature Conservation Council,
P.O. Box 5014,
Wellington.

Commission for the Environment

The Minister for the Environment can investigate appeals from the public or non-Government bodies and industries who are uncertain which authority is responsible for any environmental problem which concerns them. The Commission for the Environment, which was established by a Cabinet Minute of August 1972, has a co-ordinating

role under the Minister, and is able to involve itself with any area of Government activity to ensure that important environmental matters are not overlooked. The Commission undertakes studies on behalf of the Minsiter for the Environment and makes recommendations to him on policy matters. It works closely with the many Government Departments responsible for environmental matter, co-ordinating their activities, helping to resolve conflicting policies, and seeking action to protect environmental values. A major responsibility is the audit of environmental impact reports to which all major Government works and actions with significant environmental effects are subject, before decisions to proceed with them are taken.

Addresses: The Minister for the Environment,
Parliament Buildings,
Wellington.

The Commissioner for the Environment,
Commission for the Environment,
P.O. Box 12-042,
Wellington.

Environmental Council

The Environmental Council was established on 3 August 1970, and is a sector group of the National Development Council. It has an advisory role in all matters affecting the physical environment and is able to give advice to the Government on policy and principles in connection with such matters as coastal development, town and country planning, and the beech forest proposals. The Council includes representatives from science, architecture, industry, and the farming sector, as well as the regional county municipal authorities and appropriate Government departments.

Address: The Secretary,
Environmental Council,
P.O. Box 12-041,
Wellington.

The Clean Air Council

The Clean Air Council was established under the Clean Air Act 1972 to

advise the Minister of Health on all aspects of air pollution. It advises local authorities on their work under the Act and co-ordinates the work of control authorities and voluntary organisations. It can publish reports from time to time, and is undertaking research work through four committees:

Clean Air Zones and Domestic Heating Committee
Committee on Motor Vehicles
Committee on Rural Pollution
Planning Co-ordination Working Group

Address: The Secretary,
Clean Air Council,
P.O. Box 5013,
Wellington.

The National Water and Soil Conservation Authority
The National Water and Soil Authority (which is a central policy-making body) and its subsidiary the Water Resources Council, together with regional water boards, is responsible for maintaining the quality of natural waters in New Zealand at a satisfactory level. The Council is at present classifying all rivers and coastal waters throughout the country. The classifications are declarations of the minimum standards of quality at which the water is to be maintained and the procedure involves provision for public participation through advertising and objections. The Council and all of the regional water boards may also grant water rights (subject to public notice and objection) allowing the use of water and the discharge of wastes up to the capacity of the water within the classification set. Membership of the Authority and Council includes Government, industrial, local authority, and recreational representation.

Other Official Bodies
These include:

The Secretary,
Anti-Litter Campaign Council,
Mayfair Chambers West,
The Terrace,
Wellington.

The Secretary,
Fauna Protection Advisory Council,
C/– Dept of Internal Affairs,
Private Bag,
Wellington.

The Secretary,
National Parks Authority,
C/– Dept of Lands and Survey,
Private Bag,
Wellington.

Government Departments
Some Government departments have a particular interest in environmental matters. They include:

The Advisory Division,
Department of Lands and Survey,
P.O. Box 8003,
Wellington.

The Environmental Health Section,
Department of Health,
P.O. Box 5013 Lambton Quay,
Wellington.

The New Zealand Forest Service,
Private Bag,
Wellington.

The Water and Soil Division,
Ministry of Works,
P.O. Box 12-041 Wellington North,
Wellington.

The Wildlife Division,
Department of Internal Affairs,
Private Bag,
Wellington.

Voluntary Organisations

Besides the official bodies and Government departments listed above, there are many voluntary groups concerned with conservation matters. Some of the main national groups are listed below, but these often have local branches, and there are numerous local conservation societies, some of the which act as representatives for the National Conservation Week Campaign Committee.

The Secretary,
Federated Mountain Clubs of N.Z. (Inc.),
P.O. Box 1604,
Wellington.

The Secretary,
Royal Forest and Bird Protection Society of N.Z.,
P.O. Box 631,
Wellington.

The General Secretary,
Royal Society of New Zealand,
P.O. Box 12-249,
Wellington.

The Secretary,
N.Z. Historic Places Trust,
P.O. Box 12255,
Wellington.

The Secretary,
Environmental Defence Society,
P.O. Box 3838,
Auckland.

The Secretary,
National Executive of
N.Z. Acclimatisation Societies,
9 Lincoln Street,
Nelson.

The Secretary,
COENCO
P.O. Box 453,
Wellington.

The Secretary,
N.Z. Scenery Preservation Society
P.O. Box 2051,
Christchurch.

The Secretary,
N.Z. Ecological Society,
P.O. Box 1887,
Wellington.

The Secretary,
New Zealand Clean Air Society,
P.O. Box 2363,
Christchurch.

APPENDIX C

Young conservator award

Purpose

The Young Conservator of the Year Award is given each year as part of the National Conservation Week Campaign, and goes to a young person under the age of eighteen, who has shown an enterprising and active interest in conservation.

Young people are especially concerned with conservation issues – during Conservation Week itself as well as throughout the rest of the year – so it is appropriate that a highlight of each year's Conservation Week Campaign should be the announcement of the winner of the award, and a public presentation.

The award is intended to encourage conservation activities by young people, giving recognition to those who have made an outstanding contribution, and stimulating others to follow their example. Awards go to a boy or girl with an active and longstanding interest in conservation. It is significant that award winners are all keen to impart their knowledge and enthusiasm to others, and will often spend a lot of their time giving talks and guidance, especially to younger children.

Prizes

As well as nation-wide publicity, the Young Conservator receives a pair of inscribed binoculars and a certificate. There is also the opportunity of meeting other conservationists, and extended field trips are usually arranged.

All district finalists receive a certificate in recognition of their efforts.

What you can do

- If you know of a young person who, in your opinion, is an outstanding conservationist, why not nominate him or her for the award?
- If you think you yourself could qualify, why not get someone to nominate you?

Here are a few more details.

What the judges look for

Bearing in mind the age of the nominee, the judges look for:

- Evidence of genuine interest in conservation;
- Personal initiative in some conservation activity;
- Voluntary participation in conservation projects.

Importance is placed on sustained interest and the developing of projects rather than isolated bursts of activity.

The standard required for the award is high, and candidates should have proved that conservation is one of their major interests before they can be considered suitable.

Rules, and how to nominate

1. Candidates must not have reached their eighteenth birthday by midnight on the third of July in the year of the award.
2. Voluntary activities since August 1 of the year prior to the award will be the major consideration.
3. Nominations must be made out on the nomination from which is available from your local Conservation Week Committee. If you do not know the address of your local committee, you can obtain it by writing to:

   The Secretary,
   National Conservation Week Campaign Committee,
   P.O. Box 5014,
   Wellington.
4. Candidates must indicate their acceptance of nomination by signing the nomination form in the space provided.
5. The completed nomination form should be sent to the District Conservation Week Campaign Committee, who will be responsible for selecting one district finalist and forwarding the finalist's

nomination to the National Conservation Week Campaign Committee.

6. Only finalists who have been selected by a District Committee will be considered by the National Committee.
7. The nominations of district finalists must reach the National Conservation Week Campaign Committee by 3 July, and must be accompanied by a verifying statement from the District Committee. The envelopes containing the nominations must be marked 'AWARD'.
8. The judges' decision will be final.

APPENDIX D

Conservation citations

Conservation Citations were introduced so that the contribution to conservation made by individuals, groups, or business firms could be recognised in some tangible way. The Citations are awarded by the National Conservation Week Campaign Committee on behalf of the Nature Conservation Council.

Conditions

- There are no age limits, and the particular conservation activity for which a Citation is awarded need not be related to Conservation Week and may be extended over a relatively short or a continuing period.
- A Citation may be earned by such diverse groups and individuals as school classes or teachers, official bodies, scientists, or commercial or conservation organisations.
- Citations may be awarded for organising Conservation Week

projects, caring for environmental features and encouraging others to do the same, producing publicity and educational material, and many other activities.

- While the field for nomination is wide open, recommendations should, if possible, be for projects that have endured long enough to show results. The emphasis is on initiative and practical, tangible conservation activities.
- Each recommendation is considered by a qualified panel appointed by the National Conservation Week Campaign Committee. This ensures a national uniformity of standards, and contributes to the prestige of the awards.
- The recipient of a Conservation Citation receives a certificate, and press publicity on a national scale is arranged.

More recommendations please

A number of Citations have been awarded so far, but the limit has by no means been reached; there are a great number of people around the country who are doing an excellent, and purely voluntary job for conservation. Although such work is usually its own reward, it is also appropriate that it should be given some official recognition. That is the purpose of the Conservation Citations, and that is why the National Conservation Week Campaign Committee wants to have more recommendations for Citations.

How to nominate

Anybody can make a nomination, through their local Conservation Week Campaign Committee. If you do not know the address of your local Committee, you can obtain it by writing to:

The Secretary,
National Conservation Week Campaign Committee
P.O. Box 5014,
Wellington

The name and address of your nominee should be included, together with the reasons for your nomination, giving full details, and if possible including documentary evidence.

APPENDIX E

Some environmental terms

The widespread and increasing interest in conservation and the environment has gradually caused some common words to be used in a special sense, and has promoted the use of new words previously seldom heard.

It is not uncommon to hear many of these misused, or used imprecisely, even by experts, and the following definitions have been provided to assist in the understanding and explanation of environmental issues.

Afterburner	A device that reduces air pollution by removing organic gases through incineration.
Aquifer	An underground bed of porous material that contains water.
Attrition	Wearing down by friction. A process which can produce air and water pollutants.
Benthic region	The bottom of a body of water.
Biodegradable	Subject to decomposition by natural processes.
Biosphere	The part of the earth and its atmosphere in which living things are found.
Biota	All species of plants and animals occurring within a certain area.
Bloom	A proliferation of algae or other aquatic plants on the surface of a body of water. Often an indication of enrichment.
Buffer zone	A region between two areas each with a different use, which diminishes the effect of one upon the other.
Coliform index	A measure of the purity of water based on a count of the coliform bacteria present.

Coliform organism	An organism present in the intestinal tract of man and animals.
Community	A collection of living organisms having mutual relationships among themselves and with their environment.
Compost	A combination of various decomposed organic materials.
Catchment	The entire area from which drainage is received by a body of water.
Distrophic	Used to describe waters containing few dissolved nutrients and in which humic acids reduce the dissolved oxygen content.
Ecology	The study of living things in relation to their environment.
Ecosystem	A community of living things and the non-living elements of that community's environment considered as a unit.
Endemic	Found naturally only in a certain area or country.
Enrichment	The addition of nutrients into a water system which stimulates the growth of algae and other aquatic plants. Often a result of sewage discharges or run-off from agricultural land.
Environment	The sum of all external influences and conditions affecting the life of an organism.
Erosion	The removal of soil and subsoil by the action of wind and water.
Eutrophic	Well nourished. A condition of lakes and ponds, often brought about by human activities, which accelerates their natural aging process through stages of swamp and marsh to dry land.
Exponential	Considering any two factors one is said to be exponential if its increase or decrease accelerates in relation to the other.
Fauna	The species of animals of a region, or of a period of time.
Floc	A clump of solids formed in sewage by biological or chemical action.

Flora	The species of plants of a region, or of a period of time.
Fossil fuels	Coal, oil and natural gas which are derived from the remains of ancient plant and animal life.
Habitat	Living place of plant or animal.
Humus	Decomposed organic material.
Hydrocarbons	Compounds, found especially in fossil fuels, which contain carbon and hydrogen in various combinations.
Impoundment	A body of water confined by some sort of a barrier such as a dam.
Indigenous	Belonging naturally to.
Inversion	An atmospheric condition in which a layer of cool air is trapped by a later of warm air so that it cannot rise. Such a condition creates concentrations of air pollutants.
Irruption	A rapid major increase in an animal population which is not of a periodic or cyclic nature. Often referred to as a population explosion.
Leaching	The process by which soluble materials are removed from the soil by water.
Littoral	The shore of a body of water, particularly the seashore, above and below water level, upon which fixed aquatic plants may grow.
Natural resources	Natural elements (matter and energy) available for man's use.
Nutrients	Elements or compounds essential as raw materials to sustain life.
Optimum	Most favourable.
Organic	Referring to or derived from living organisms.
Organism	Any living human, plant, or animal.
Oxidation pond	A man-made lake or pond in which organic wastes are broken down by bacterial action.
Pesticides	Chemical substances used to control 'harmful' plants or animals. Depending upon their application they are divided into herbicides, insecticides, fungicides, etc.

Pollution	The presence of unwanted matter or energy (heat, noise, etc.) whose location, nature, or quantity produce undesirable effects.
Potable	Drinkable.
Run-off	That portion of rainfall, melted snow, or irrigation water which is discharged from an area by surface flow.
Smog	A combination of smoke and fog resulting in serious air pollution.
Sustained yield	The number of animals or the amount of plant material that may be removed periodically from a population or area without affecting the capacity for renewal.
Tolerance	The relative ability of an organism to endure an unfavourable environmental factor.
Troposphere	That layer of the atmosphere which extends eleven to sixteen kilometres above the earth.
Watershed	The area of land from which the waters of a stream or stream system originate.

APPENDIX F

Selected conservation literature

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NOTES

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